





Northeastern University  
Library

Digitized by the Internet Archive  
in 2011 with funding from  
Boston Library Consortium Member Libraries









**1976 • 1977**  
**BASIC DAY COLLEGES**  
**COURSE DESCRIPTIONS**  
**AND CURRICULUM**  
**GUIDE**



**NORTHEASTERN**  
**UNIVERSITY**

9258  
89-1

# **NORTHEASTERN UNIVERSITY BULLETIN**

**1976  
1977**

## **COURSE DESCRIPTIONS AND CURRICULUM GUIDE**

Boston-Bouvé College  
College of Business Administration  
College of Criminal Justice  
College of Education  
College of Engineering  
Lincoln College  
College of Liberal Arts  
College of Nursing  
College of Pharmacy and  
Allied Health Professions

*Students are requested to retain their copy of the 1976-1977 Course Descriptions and Curriculum Guide. Although a new Curriculum Guide will be issued for 1977-1978, the Course Descriptions will remain unchanged from 1976-1978.*

Northeastern University charges tuition for all courses taken above the normal academic load.

The University reserves the right to make changes in the regulations and courses announced in this bulletin.

Printed by Northeastern University Press.

# Contents

Curriculum Guide 1976-77	5
Boston-Bouvé College	5
College of Business Administration	8
College of Criminal Justice	13
College of Education	14
College of Engineering	20
Lincoln College	26
College of Liberal Arts	27
College of Nursing	40
College of Pharmacy and Allied Health Professions	42
Course Descriptions 1976-78	45

### **Equal Opportunity Policy**

Northeastern University is committed to a policy of providing equal opportunity for all. In all matters involving admission, registration, and all official relationships with students, including evaluation of academic performance, the University insists on a policy of nondiscrimination. Northeastern University is also an equal opportunity employer; it is institutional policy that there shall not be any discrimination against any employee or applicant for employment because of race, color, religion, sex, age, national origin, or on the basis of being a handicapped but otherwise qualified individual. In addition, Northeastern takes affirmative action in the recruitment of students and employees. Inquiries concerning our equal opportunity policies may be referred to the University Affirmative Action officer and/or the Title IX coordinator.

### **Delivery of Services**

The University assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements and acts of public authorities. The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities or performance, but its inability or failure to do so shall not subject it to liability.



Boston-Bouvé  
College

PHYSICAL EDUCATION—  
Men and Women

10.104, Fundamentals of Mathematics, 50.121, Human Development and Learning I, 62.250, Anatomy and Physiology I, Physical Education elective, General Studies elective	Quarter 4
50.131, Human Development and Learning II, 50.142, Introduction to Educational Statistics, 62.251, Anatomy and Physiology II, 62.218, Elementary School Activities or General Studies elective, Physical Education elective Before registering for Quarter 6, each student will be asked to designate a level of teaching option elementary or secondary physical education	Quarter 5
62.221, Perceptual-Motor Learning and Development, 62.252, Anatomy and Physiology III, 62.255, Adapted Physical Education, 62.275, Critical Teaching Skills, Physical Education elective	Quarter 6
62.210, History and Philosophy of Physical Education, 62.253, Kinesiology, 62.260, Measurement and Evaluation, Physical Education elective, General Studies elective	Quarter 7
62.254, Exercise Physiology, two Analysis and Coaching electives, two General Studies electives	Quarter 8
62.277, Outdoor Teaching Laboratory, 62.218, Elementary School Activities I or 62.256, Athletic Training and Conditioning; two Analysis and Coaching electives, two Boston-Bouvé College electives	Quarter 9
62.282, Supervised Student Teaching	Quarter 10
62.270, Administration of Physical Education, 62.280, Curriculum Development, Boston-Bouvé College elective, General Studies elective	Quarter 11

HEALTH EDUCATION

19.105, Foundations of Psychology I, 50.121, Human Development and Learning I, 62.250, Anatomy and Physiology I, General Studies elective	Quarter 4
19.106, Foundations of Psychology II, 50.131, Human Development and Learning II, 62.251, Anatomy and Physiology II, 65.116, Nutrition	Quarter 5

- Quarter 6** 18 120, Microbiology, 20 100, Social Anthropology; 62 252, Anatomy and Physiology III; 65 114, Mental Health.
- Quarter 7** 50 141, Measurement and Evaluation; 65 222, Drug Use and Abuse; 65 225, Communicable and Degenerative Diseases, General Studies elective
- Quarter 8** 56 120, Introduction to Special Education; 65 217, Teaching Procedures/Curriculum in Health Education in School and Community; 65 223, Human Sexuality and the Family; General Studies elective
- Quarter 9** 65 140, Concepts in Health, Aging and Longevity; 65 219, Evolving Patterns of Community Health; 65 238, Seminar Health Education; General Studies electives
- Quarter 10** 65 240, Practicum in School Health; 65 241, Practicum in Community Health
- Quarter 11** 65 233, Organization and Administration of School and Community Health; 65 235, Health Counseling, 65 239, Seminar Health Education; 50 , Human Foundations elective.

## PHYSICAL THERAPY

- Quarter 4** 11 171, Physics for the Life Sciences I; 11 173, Physics Laboratory for the Life Sciences I, 18 143, Human Physiology I; 62 221, Perceptual Motor Learning; elective
- Quarter 5** 11 172, Physics for the Life Sciences II, 18 144, Human Physiology II, 18 148, Human Anatomy; 64 115, Introduction to Physical Therapy; 19 106, Foundations of Psychology II
- Quarter 6** 64 123, Gross Anatomy, 64 126, Physiology for Physical Therapists, 64 141, Physical Therapy I; 64 210, Pathology, 64 227, Clinical Medicine I, 64 234, Clinical Psychiatry
- Quarter 7** 64 130, Applied Anatomy, 64 142, Physical Therapy II; 64 143, Physical Therapy III, 64 229, Clinical Medicine III
- Quarter 8** 64 156, Physical Therapy IV, 64 158, Physical Therapy V, 64 171, Physical Therapy VI, 64 250, Neuroanatomy
- Quarter 9** 64 159, Clinical Seminar, 64 169, Physical Therapy VII, 64 184, Supervised Clinical Education, 64 230, Clinical Medicine III
- Quarter 10** 64 167, Research Design, 64 173, Rehabilitation, 64 178, Physical Therapy VIII, two electives
- Quarter 10A** 64 194, Supervised Clinical Education II
- Quarter 11** 64 176, Administration, 64 182, Psycho Social Aspects of Illness, 64 239, Investigative Studies, elective

RECREATION  
EDUCATION

50.121, Human Development and Learning, Earth Science elective, 63.150, Anatomy and Physiology I; 63.148, Introduction to Out- doors or 63.255, Introduction to Therapeutic Recreation or 63.263, Introduction to Community Recreation, Recreation Skills.	Quarter 4
50.131, Human Development and Learning II, Earth Science elective; 63.151, Anatomy and Physiology II; 63.12P, Sports Leadership or 63.12Q, Survey Aquatics; Skills.	Quarter 5
29.163, Workshop Drama, two-three electives; Skills.	Quarter 6
63.128, Survey of Recreation Facilities; three-four electives; Skills.	Quarter 7
63.250, Group Dynamics, three-four electives	Quarter 8
63.280, Supervised Field Experience	Quarter 9
63.285, Research, three-four electives.	Quarter 10
63.290, Senior Seminar, three-four electives	Quarter 11

<i>Department Electives</i>	<i>Quarters Offered</i>
63.126 Outdoor Education I	6
63.127 Outdoor Education II	7-8-11
63.129 School Camping (spring)	7-11
63.145 Winter Sports (winter)	8-10
63.146 Camp Administration	10
63.147 Outdoor Education for Handicapped (summer only)	7
63.149 Elements of Outdoor Planning	6-8
63.152 Analysis of Movement as Applied to Recreation (spring)	7-11
63.153 Psychological Aspects of Disabilities	6-8-10
63.160 Technological Resources	7-11
63.210 Philosophy of Recreation and Leisure (spring)	7-11
63.216 Seminar on Outdoor Issues and Legislation	6-8-10
63.220 Methods and Materials in Recreation	6-8-10
63.249 Process of Aging	8-10
63.256 Activities for Special Populations	8-10
63.257 Adaptive Workshop (spring only)	7-11
63.260 Administration of Parks and Recreation	6-8-10
63.262 Budget and Finance	6-8-10
63.266 Community Schools	7-11
63.812 Seminar in Contemporary Issues in Recreation (winter)	10
63.830 Advanced Administration of Recreation Services (fall)	10

## College of Business Administration

### ACCOUNTING

Quarter 4	43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity, 49.250, Quantitative Methods I, 41.113, Accounting Principles III; liberal elective
Quarter 5	43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity, 49.251, Quantitative Methods II; two liberal electives
Quarter 6	41.251, Intermediate Accounting, 45.209, Organization Behavior I; liberal elective, Business elective.
Quarter 7	41.252, Intermediate Accounting, 41.254, Cost Accounting; 45.210, Organization Behavior II, liberal elective
Quarter 8	41.262, Accounting Theory and Practice or 41.263, Accounting Planning and Control; liberal elective, Business elective; open elective
Quarter 9	45.250, Business and Society, liberal elective; open elective; Accounting elective
Quarter 10	45.112, Business Policy, liberal elective, two open electives.
Quarter 11	All open electives

### ENTREPRENEURSHIP AND NEW VENTURE MANAGEMENT

Quarter 4	43.120, Introduction to Marketing, 49.250, Quantitative Methods I; two liberal electives
Quarter 5	44.120, Introduction to Financial Activity, 49.251, Quantitative Methods II, two liberal electives
Quarter 6	45.209, Organization Behavior I, 45.212, New Venture Creation; liberal elective, open elective
Quarter 7	45.210, Organization Behavior II, liberal elective, open electives.
Quarter 8	45.130, Operations Analysis and Venture Capital, liberal elective; open elective, Business elective
Quarter 9	44.159, Small Business Finance, 45.250, Business and Society; liberal elective, open elective
Quarter 10	45.112, Business Policy, liberal elective, open elective, Business elective
Quarter 11	49.107, Small Business Management, Business elective, open electives.

FINANCE AND  
INSURANCE

43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; two liberal electives.	Quarter 4
43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; two liberal electives	Quarter 5
44.152, Corporate Finance I; 44.275, Money and Economic Activity; 45.209, Organization Behavior I; liberal elective	Quarter 6
44.153, Corporate Finance II; 44.181, Investment management; 45.210, Organization Behavior II; liberal elective	Quarter 7
Liberal elective; Finance elective; Business elective, open elective.	Quarter 8
45.250, Business and Society; Finance elective; liberal elective, open elective	Quarter 9
45.112, Business Policy, liberal elective; two open electives	Quarter 10
All open electives	Quarter 11

GENERAL BUSINESS  
ADMINISTRATION

43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; two liberal electives.	Quarter 4
49.251, Quantitative Methods II; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; two liberal electives.	Quarter 5
45.209, Organization Behavior I; liberal elective, Business elective, open elective.	Quarter 6
45.210, Organization Behavior II, liberal elective, Business elective, open elective.	Quarter 7
Liberal elective; two Business electives, open elective	Quarter 8
45.250, Business and Society; liberal elective; Business elective, open elective.	Quarter 9
45.112, Business Policy, liberal elective, Business elective, open elective	Quarter 10
Business elective, three open electives	Quarter 11

HUMAN RESOURCES  
MANAGEMENT

43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; two liberal electives.	Quarter 4
43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; two liberal electives.	Quarter 5

<b>Quarter 6</b>	45.209, Organization Behavior I; two open electives; liberal elective
<b>Quarter 7</b>	45.210, Organization Behavior II, 45.272, People and Productivity, open elective, liberal elective
<b>Quarter 8</b>	45.273, Personnel Administration or 45.215, Organizational Structure and Process, open elective, liberal elective, Human Resources Management elective
<b>Quarter 9</b>	45.250, Business and Society, open elective, liberal elective, Human Resources Management elective.
<b>Quarter 10</b>	45.274, Contemporary Labor Issues or 45.216, Managerial Skills Seminar, 45.112, Business Policy, Human Resources Management elective, liberal elective
<b>Quarter 11</b>	Business elective, three open electives

## **INTERNATIONAL BUSINESS ADMINISTRATION**

<b>Quarter 4</b>	43.120, Introduction to Marketing, 49.250, Quantitative Methods I; two liberal electives
<b>Quarter 5</b>	44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II, two liberal electives
<b>Quarter 6</b>	45.209, Organization Behavior I, 46.100, Introduction to International Business, liberal elective, open elective
<b>Quarter 7</b>	45.210, Organization Behavior II; Business elective, Liberal International elective, open elective.
<b>Quarter 8</b>	Liberal International elective, Business elective; liberal elective; open elective
<b>Quarter 9</b>	45.250, Business and Society, Business elective, Business International elective, open elective
<b>Quarter 10</b>	45.112, Business Policy, Business International elective, liberal elective, two open electives
<b>Quarter 11</b>	46.101, Seminar in International Business, Business International elective, two open electives

## **MANAGEMENT**

<b>Quarter 4</b>	43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity, 49.250, Quantitative Methods I, two liberal electives
<b>Quarter 5</b>	43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity, 49.251, Quantitative Methods II, two liberal electives
<b>Quarter 6</b>	45.209, Organization Behavior I, 49.206, Management Information Systems, liberal elective, open elective
<b>Quarter 7</b>	45.210, Organization Behavior II, 45.272, People and Productivity; 41.205, Cost Accounting for Management, open elective

49 155, Legal Aspects of Business; Business elective, two liberal electives	<b>Quarter 8</b>
45 250, Business and Society; 45 265, Production Management, liberal elective; open elective	<b>Quarter 9</b>
45 112, Business Policy; 90 251, liberal elective; two open electives	<b>Quarter 10</b>
All open electives	<b>Quarter 11</b>

## MARKETING

43 120, Introduction to Marketing or 44 120, Introduction to Financial Activity; 49 250, Quantitative Methods I, two liberal electives	<b>Quarter 4</b>
43 120, Introduction to Marketing or 44 120, Introduction to Financial Activity; 49 251, Quantitative Methods II; two liberal electives	<b>Quarter 5</b>
43 250, Marketing Management I; 45 209, Organization Behavior I, liberal elective; open elective	<b>Quarter 6</b>
43 251, Marketing Management II; 45 210, Organization Behavior II; liberal elective; open elective	<b>Quarter 7</b>
43 240, Marketing Research; liberal elective; Business elective; open elective	<b>Quarter 8</b>
45 250, Business and Society; Marketing elective; liberal elective; open elective	<b>Quarter 9</b>
43 278, Competitive Strategy; 45 112, Business Policy; liberal elective; open elective	<b>Quarter 10</b>
Marketing elective; three open electives	<b>Quarter 11</b>

## TRANSPORTATION AND PHYSICAL DISTRIBUTION MANAGEMENT

43 120, Introduction to Marketing or 44 120, Introduction to Financial Activity; 49 250, Quantitative Methods I, two liberal electives	<b>Quarter 4</b>
43 120, Introduction to Marketing or 44 120, Introduction to Financial Activity; 49 251, Quantitative Methods II, two liberal electives	<b>Quarter 5</b>
48 101, Principles of Transportation; 45 209, Organization Behavior I, liberal elective; open elective	<b>Quarter 6</b>
45 210, Organization Behavior II; 48 102, Current Issues in Transportation Policy; liberal elective; open elective	<b>Quarter 7</b>

<b>Quarter 8</b>	Transportation elective, Business elective; liberal elective; open elective
<b>Quarter 9</b>	45.250, Business and Society; 48.104, Physical Distribution Management; liberal elective; open elective
<b>Quarter 10</b>	45.112, Business Policy, Transportation elective; liberal elective; open elective
<b>Quarter 11</b>	Transportation elective; three open electives



College of  
Criminal Justice

CRIMINAL JUSTICE

19.120, Statistics in Psychology I; 92.137, Criminology, 92.141, Criminal Law; 11.113, Physics for Criminal Justice Students I or 12.139, General Chemistry or 18.114, Functional Human Anatomy I.	Quarter 4
22.141, State Government and Politics; 92.134, Constitutional Problems I; 92.157, Research Methods in Criminal Justice, 11.114, Physics for Criminal Justice Students II or 12.140, General Chemistry or 18.115, Functional Human Anatomy II.	Quarter 5
Eight Quarter hours of Criminal Justice electives or Eight Quarter hours of Non-Criminal Justice electives.	Quarters 6-11

## College of Education

The College of Education listings include the two terms "area elective" and "specified elective(s)" which are defined as follows:

- 1 "area elective" this term refers to an elected course in the Elementary Education major's area concentration in the Humanities, Early Childhood, Reading-Language, Science-Mathematics, Social Sciences, Special Education, or Early Childhood Education
- 2 "specified elective(s)" this term refers to an elected course in one of the three required Distribution areas. The Distribution requirements are in the Humanities, Social Sciences, and Mathematics-Science areas. Distribution requirements apply to all majors in the College of Education.

If students have any curriculum questions, they should discuss their academic needs with counselors in the College

### ELEMENTARY EDUCATION

<b>Quarter 4</b>	56 120, Introduction to Special Education, 50 121, Human Development and Learning I, specified electives.
<b>Quarter 5</b>	Area elective, Education Psychology elective; specified electives.
<b>Quarter 6</b>	51 131, Fundamentals of Arithmetic I, 51 133, Fundamentals of Reading I, 51 135, Analysis of Teaching and Educational Process; area elective
<b>Quarter 7</b>	51 132, Fundamentals of Arithmetic II, 51 134, Fundamentals of Reading II, area elective, specified elective
<b>Quarter 8</b>	51 141, Elementary Education, 90 253, Professional Development for Teachers, area elective, specified electives.
<b>Quarter 9</b>	50 141, Measurement and Evaluation, 51 142, Elementary Education Compendium II, area elective, elective
<b>Quarter 10</b>	Education Humanities elective, area elective, specified electives.
<b>Quarter 11</b>	Area elective, specified elective

### TEACHING OF BIOLOGY

<b>Quarter 4</b>	50 131, Human Development and Learning II, specified electives.
<b>Quarter 5</b>	Education Psychology elective, specified electives
<b>Quarter 6</b>	51 135, Analysis of Teaching and Educational Process, specified electives
<b>Quarter 7</b>	Specified electives
<b>Quarter 8</b>	51 147, Methods and Materials of Teaching the Sciences, 50 141, Measurement and Evaluation, 90 253, Professional Development for Teachers, specified electives.

Specified electives	Quarter 9
Education Humanities elective; specified electives	Quarter 10
Specified electives	Quarter 11

## TEACHING OF CHEMISTRY

50.131, Human Development and Learning II, specified electives	Quarter 4
Education Psychology elective; specified electives	Quarter 5
51.135, Analysis of Teaching and Educational Process, specified electives	Quarter 6
Specified electives	Quarter 7
50.141, Measurement and Evaluation, 51.147, Methods and Materials of Teaching the Sciences; 90.253, Professional Development for Teachers; specified electives	Quarter 8
Specified electives	Quarter 9
Education Humanities elective; specified electives	Quarter 10
Specified electives	Quarter 11

## TEACHING OF EARTH SCIENCE

50.131, Human Development and Learning II, specified electives	Quarter 4
Education Psychology elective; specified electives	Quarter 5
51.135, Analysis of Teaching and Educational Process, specified electives	Quarter 6
Specified electives	Quarter 7
51.147, Methods and Materials of Teaching the Sciences, 50.141, Measurement and Evaluation, 90.253, Professional Development for Teachers; specified electives	Quarter 8
Specified electives	Quarter 9
Education Humanities elective; specified electives	Quarter 10
Specified electives	Quarter 11

## TEACHING OF ENGLISH

50.131, Human Development and Learning II, specified electives	Quarter 4
Education Psychology elective; specified electives	Quarter 5
51.135, Analysis of Teaching and Educational Process, specified electives	Quarter 6
Specified electives	Quarter 7
50.141, Measurement and Evaluation, 51.143, Methods and Materials of Teaching English, 90.253, Professional Development for Teachers; specified electives	Quarter 8

<b>Quarter 9</b>	51.139, Writing and the Teaching of Writing, 51.126, Teaching of Reading in Secondary Schools; specified electives.
<b>Quarter 10</b>	Education Humanities elective; specified electives.
<b>Quarter 11</b>	Specified electives

## **TEACHING OF GENERAL SCIENCE**

<b>Quarter 4</b>	50.131, Human Development and Learning II; specified electives.
<b>Quarter 5</b>	Education Psychology elective; specified electives
<b>Quarter 6</b>	51.135, Analysis of Teaching and Educational Process; specified electives
<b>Quarter 7</b>	Specified electives.
<b>Quarter 8</b>	50.141, Measurement and Evaluation or an elective; 51.147, Methods and Materials of Teaching the Sciences; 90.253, Professional Development for Teachers; specified electives.
<b>Quarter 9</b>	Specified electives
<b>Quarter 10</b>	Education Humanities elective, specified electives
<b>Quarter 11</b>	Specified electives.

## **TEACHING OF MATHEMATICS**

<b>Quarter 4</b>	50.131, Human Development and Learning II, specified electives
<b>Quarter 5</b>	Education Psychology elective, specified electives
<b>Quarter 6</b>	51.135, Analysis of Teaching and Educational Process; specified electives
<b>Quarter 7</b>	Specified electives
<b>Quarter 8</b>	50.141, Measurement and Evaluation, 51.126, Teaching of Reading in Secondary Schools, 51.145, Methods and Materials of Teaching Mathematics, 90.253, Professional Development for Teachers
<b>Quarter 9</b>	Specified electives
<b>Quarter 10</b>	Education Humanities elective, specified electives
<b>Quarter 11</b>	Specified electives

## **TEACHING OF MODERN LANGUAGES**

<b>Quarter 4</b>	50.131, Human Development and Learning II, specified electives
<b>Quarter 5</b>	Education Psychology elective, specified electives.
<b>Quarter 6</b>	51.135, Analysis of Teaching and Educational Process, specified electives.
<b>Quarter 7</b>	Specified electives.

50.141, Measurement and Evaluation, 51.140, Methods and Materials of Teaching Modern Languages I, 90.253, Professional Development for Teachers, specified electives	<b>Quarter 8</b>
51.144, Methods and Materials of Teaching Modern Languages II, specified electives	<b>Quarter 9</b>
Education Humanities elective; specified electives.	<b>Quarter 10</b>
Two Advanced Language electives	<b>Quarter 11</b>

## TEACHING OF MUSIC

28. ., Strings I; *28. ., Music Theory III, 50.121, Human Development I, specified elective.	<b>Quarter 4</b>
28. ., Strings II; *28. ., Music History or specified elective, 11.109, Physics in Music, 50.131, Human Development II.	<b>Quarter 5</b>
28. ., Woodwinds I; *28. ., Organization of Instrumental Programs; 51.135, Analysis of Teaching, specified elective	<b>Quarter 6</b>
28. ., Woodwinds II; *28. ., Voice, 51.127, Teaching Music in Elementary Schools; specified elective.	<b>Quarter 7</b>
28. ., Brass I; 51.128, Teaching Music in Secondary Schools I, 90.253, Professional Development; two specified electives	<b>Quarter 8</b>
28. ., Brass II, 51.129, Teaching Music in Secondary Schools II, 50.141, Measurement and Evaluation; specified elective	<b>Quarter 9</b>
28. ., Percussion; Education Humanities elective, two specified electives.	<b>Quarter 10</b>
3 specified electives.	<b>Quarter 11</b>

## TEACHING OF PHYSICS

50.131, Human Development and Learning II, specified electives.	<b>Quarter 4</b>
Education Psychology elective; specified electives	<b>Quarter 5</b>
51.135, Analysis of Teaching and Educational Process; specified electives.	<b>Quarter 6</b>
3 specified electives	<b>Quarter 7</b>
50.141, Measurement and Evaluation, 51.147, Methods and Materials of Teaching the Sciences, 90.253, Professional Development for Teachers; specified electives	<b>Quarter 8</b>
3 specified electives	<b>Quarter 9</b>
Education Humanities elective, specified electives.	<b>Quarter 10</b>
3 specified electives.	<b>Quarter 11</b>

## TEACHING OF SOCIAL STUDIES

50.131, Human Development and Learning II, specified electives	<b>Quarter 4</b>
Education Psychology elective; specified electives.	<b>Quarter 5</b>

<b>Quarter 6</b>	51.135, Analysis of Teaching and Educational Process; specified electives
<b>Quarter 7</b>	Specified electives
<b>Quarter 8</b>	50.141, Measurement and Evaluation, 51.149, Methods and Materials of Teaching Social Studies; 90.253, Professional Development for Teachers
<b>Quarter 9</b>	51.126, Teaching Reading in Secondary Schools, specified electives
<b>Quarter 10</b>	50.154, Current Issues in American Education; specified electives
<b>Quarter 11</b>	Specified electives

## **SPEECH AND AUDIOLOGY**

<b>Quarter 4</b>	50.142, Introduction to Educational Statistics; 56.120, Introduction to Special Education, 55.123 Speech Science; 55.124, Anatomy of Auditory Mechanisms
<b>Quarter 5</b>	50.121, Human Development and Learning I; 55.126, Anatomy of Vocal Mechanisms, 55.133, Developmental Phonology, specified elective
<b>Quarter 6</b>	19.135, Personality I, 55.131, Developmental Semantics, 55.142, Introductory Audiology; specified elective.
<b>Quarter 7</b>	19.136, Personality II, 55.141, Phonemic Disorders, Educational Psychology elective, specified elective.
<b>Quarter 8</b>	51.133, Fundamentals of Reading I, 55.154, Fluency Disorders; 90.253, Professional Development for Teachers; specified electives
<b>Quarter 9</b>	55.143, Diagnostic Techniques, 55.141, Orientation to Clinical Practice; specified electives
<b>Quarter 10</b>	19.201, Abnormal Behavior; Education Humanities elective, two specified electives
<b>Quarter 11</b>	Specified electives

## HUMAN SERVICES

50.121, Human Development and Learning I, Speech elective specified electives	<b>Quarter 4</b>
50.131, Human Development and Learning II, 50.161, Seminar in Group Process, specified electives	<b>Quarter 5</b>
19.135, Personality I, 92.160, Social Welfare Problems, 50.142, Introduction to Educational Statistics, specified elective.	<b>Quarter 6</b>
19.136, Personality II; 50.133, Educational Applications of Social Psychology, 21.255, Sociology of Formal Organizations; specified elective	<b>Quarter 7</b>
19.201, Abnormal Psychology 56.150, Introduction to Rehabilita- tion, Counseling Theory and Process, 90.253 Professional Development for Teachers; specified elective	<b>Quarter 8</b>
Human Services elective; Community Planning for Rehabilitation, Principles of Medical Rehabilitation specified elective	<b>Quarter 9</b>
Two Human Services electives; Education Humanities elective	<b>Quarter 10</b>
Human Services elective, specified elective	<b>Quarter 11</b>

## College of Engineering

### CHEMICAL ENGINEERING

#### CLASS OF '80

**Quarter 4** 4 101, Chemical Engineering Calculations I, 10 153, Calculus; 11 206, Physics for Engineering Students IV, 11 110, Physics Laboratory for Engineering Students I; 12 147, Organic Chemistry.

**Quarter 5** 4 102, Chemical Engineering Calculations II, 4 106, Polymer Science Engineering, 10 154, Calculus, 11 111, Physics Laboratory for Engineering Students II, 12 148, Organic Chemistry.

#### CLASS OF '79

**Quarter 6** 4 111, Chemical Engineering I, 10 155, Mathematical Analysis; 12 161, Physical Chemistry, 39 115, Economics

**Quarter 7** 4 112, Chemical Engineering II, 10 156, Mathematical Analysis; 12 162, Physical Chemistry, 39 116, Economics

#### CLASS OF '78

**Quarter 8** 4 121, Transport Phenomena I, 4 123, Experimental Methods I; 4 126, Chemical Engineering Thermodynamics; 4 141, Junior Honors Program (elective), liberal elective

**Quarter 9** 4 122, Transport Phenomena II, 4 124, Experimental Methods II; 4 136, Chemical Engineering Kinetics, 4 141, Junior Honors Program (elective), liberal elective

#### CLASS OF '77

**Quarter 10** 4 131, Process Design I, or 4 133, Projects I, two Chemical Engineering electives, liberal elective

**Quarter 11** 4 132, Process Design II, or 4 134, Projects II, two Chemical Engineering electives, liberal elective

### CIVIL ENGINEERING

#### CLASS OF '80

**Quarter 4** 1 116, Engineering Measurements and 1 117, Engineering Measurements Laboratory or 1 140, Structural Mechanics I, 10 153, Calculus, 11 110, Physics Laboratory for Engineering Students I; 11 206, Physics for Engineering Students IV, 39 115, Economics.

**Quarter 5** 1 116, Engineering Measurements and 1 117, Engineering Measurements Laboratory or 1 140, Structural Mechanics I, 2 130, Thermodynamics I, 10 154, Calculus, 11 111, Physics Laboratory for Engineering Students II, 39 116, Economics



### CLASS OF '79

1.141, Structural Mechanics II; 2.116, Dynamics; 10.155, Mathematical Analysis; liberal elective **Quarter 6**

1.120, Fluid Mechanics I; 1.143, Structural Analysis I; 1.180, Materials; 10.156, Mathematical Analysis; 29.113, Effective Speaking Workshop. **Quarter 7**

### CLASS OF '78

3.183, Electrical Engineering I; 1.150, Concrete Design I or 1.178, Soil Mechanics and 1.179, Soil Mechanics Laboratory; liberal elective, \*technical elective **Quarter 8**

1.193, Environmental Engineering I; 1.178, Soil Mechanics and 1.179, Soil Mechanics Laboratory or 1.150, Concrete Design I; liberal elective; \*technical elective **Quarter 9**

### CLASS OF '77

1.160 Structural Design I; liberal elective, \*two technical electives **Quarter 10**

Liberal elective, \*three technical electives **Quarter 11**

## ELECTRICAL ENGINEERING

### CLASS OF '80

3.111, Circuits and Systems I; 3.151, E E Laboratory I-A; 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; liberal elective **Quarter 4**

2.163, Mechanics for Electrical Engineers; 3.112, Circuits and Systems II; 3.152, E E Laboratory I-B; 10.154, Calculus; 11.111, Physics Laboratory for Engineering Students II; liberal elective **Quarter 5**

### CLASS OF '79

2.130, Thermodynamics I; 3.101, Discrete Systems; 3.113, Circuits and Systems III; 3.153, E E Laboratory II-A; 10.155, Mathematical Analysis **Quarter 6**

3.122, Circuits and Systems IV; 3.154, E E Laboratory II-B; 3.141, Electronics I; 10.156, Mathematical Analysis; liberal elective **Quarter 7**

### CLASS OF '78

2.199, Materials Science; 3.142, Electronics II; 3.155, E E Laboratory III-A; 3.161, Electromagnetic Field Theory I; liberal elective. **Quarter 8**

3.144, Electronics III; 3.156, E E Laboratory III-B; 3.162, Electromagnetic Field Theory II; 3.191, Design and Organization of Digital Computers; liberal elective **Quarter 9**

### CLASS OF '77

3.134, E E Laboratory IV; 3.175, Electromechanical Dynamics; **Quarter 10**

3.144, Electronics III; \*two technical electives; liberal elective.

liberal elective; \*two or three technical electives **Quarter 11**

## **ELECTRICAL ENGINEERING Power Systems**

### **CLASS OF '80**

- Quarter 4** 3 111, Circuits and Systems I, 3 151, E E Laboratory I-A, 10 153, Calculus, 11 206, Physics for Engineering Students IV, 11 110, Physics Laboratory for Engineering Students I, liberal elective.
- Quarter 5** 2 163, Mechanics for Electrical Engineers, 3 112, Circuits and Systems II, 3 152, E.E. Laboratory I-B, 10 154, Calculus, 11 111, Physics Laboratory for Engineering Students II, liberal elective.

### **CLASS OF '79**

- Quarter 6** 2 130, Thermodynamics I, 3 113, Circuits and Systems III, 3 131, E E Laboratory I-Measurements, 3 153, E E Laboratory II-A, 10 155, Mathematical Analysis, liberal elective.
- Quarter 7** 2 131, Thermodynamics II, 3 122, Circuits and Systems IV, 3 141, Electronics I, 3 154, E E Laboratory II-B, 10 156, Mathematical Analysis

### **CLASS OF '78**

- Quarter 8** 3 142, Electronics II, 3 161, Electromagnetic Field Theory I, 3 221, Electrical Power Systems, 3 245, Power Laboratory, liberal elective
- Quarter 9** 3 162, Electromagnetic Field Theory II, 3 177, Electrical Machines, 3 222, Electrical Power Systems, 3 246, Power Laboratory, liberal elective

### **CLASS OF '77**

- Quarter 10** 3 176, Machines and Systems, 3 178, Transients in Electrical Power Systems, 3 234, Power Laboratory II, 3 236, Nuclear Engineering, liberal elective
- Quarter 11** 3 224, Power Systems Seminar, one or two technical electives, liberal elective

## **ELECTRICAL ENGINEERING Computer Engineering**

### **CLASS OF '80**

- Quarter 4** 3 111, Circuits and Systems I, 3 151, E E Laboratory I-A, 10 153, Calculus, 11 206, Physics for Engineering Students IV, 11 110, Physics Laboratory for Engineering Students I, liberal elective
- Quarter 5** 2 163, Mechanics for Electrical Engineers, 3 112, Circuits and Systems II, 3 152, E E Laboratory I-B, 10 154, Calculus, 11 111, Physics Laboratory for Engineering Students II, liberal elective.

### **CLASS OF '79**

- Quarter 6** 10 155, Mathematical Analysis, 3 113, Circuits and Systems III, 3 101, Discrete Systems, 2 130, Thermodynamics, 3 153, E E Laboratory II-A

3.141, Electronics I, 3.122, Circuits and Systems IV, 3.191, Design and Organization of Digital Computers, 3.154, E.E. Laboratory II-B, liberal elective **Quarter 7**

#### CLASS OF '78

3.142, Electronics II, 3.161, Electromagnetic Field Theory I, 3.192, Introduction to Digital Computation II, 3.155, E.E. Laboratory II-B, liberal elective **Quarter 8**

3.144, Electronics III, 3.162, Electromagnetic Field Theory II, 3.281, Machine Language and Programming, 3.156, E.E. Laboratory III-B, liberal elective **Quarter 9**

## GENERAL ENGINEERING PROGRAM

#### CLASS OF '80

10.153, Calculus, 11.206, Physics for Engineering Students IV, 11.110, Physics Laboratory for Engineering Students I, liberal elective, Engineering Science elective **Quarter 4**

10.154, Calculus, 11.111, Physics Laboratory for Engineering Students II, liberal elective, Engineering Science elective, Coordinated Study **Quarter 5**

#### CLASS OF '79

Liberal elective, Engineering Science elective, Coordinated Studies **Quarter 6**

Liberal elective, Engineering Science electives, Coordinated Studies **Quarter 7**

#### CLASS OF '78

Two Engineering Science electives; two Coordinated Studies **Quarter 8**

Two Engineering Science electives; two Coordinated Studies **Quarter 9**

#### CLASS OF '77

Two Engineering Science electives; two Coordinated Studies **Quarter 10**

Two Engineering Science electives; two Coordinated Studies **Quarter 11**

## GENERAL ENGINEERING Computer Science Option

#### CLASS OF '80

10.153, Calculus, 11.206, Physics, 11.110, Physics Laboratory, Computer Science Elective, liberal elective **Quarter 4**

10.154, Calculus, 11.111, Physics Laboratory; Coordinated Studies; Computer Science Elective, liberal elective **Quarter 5**

#### CLASS OF '79

Two Computer Science Electives, Coordinated Studies, liberal elective **Quarter 6**

Two Computer Science Electives, Coordinated Studies, liberal elective **Quarter 7**

## INDUSTRIAL ENGINEERING

### CLASS OF '80

- Quarter 4** 5 128, Work Design, 10 153, Calculus, 11 206, Physics for Engineering Students IV, 11 110, Physics Laboratory for Engineering Students I, 39 115, Principles and Problems of Economics.
- Quarter 5** 2 165, Mechanics I, 5 145, Probabilistic Analysis for Engineers; 10 154, Calculus, 11 111, Physics Laboratory for Engineering Students II, 39 116, Principles and Problems of Economics

### CLASS OF '79

- Quarter 6** 5 147, Statistics I, Mathematics elective, 3 183, Electrical Engineering I, 5 201, Principles of Computation and Programming I.
- Quarter 7** 5 148, Statistics II; 5 161, Operations Research I, liberal elective; Engineering Science elective

### CLASS OF '78

- Quarter 8** 5 150, Financial Cost Control, 5 163, Operations Research I; liberal elective, technical elective, 29 102, Effective Speaking
- Quarter 9** 5 130, Systems I, Engineering Science elective, technical elective; liberal elective

### CLASS OF '77

- Quarter 10** 5 131, Systems II; 5 186, People in Organizations; Industrial Engineering elective, liberal elective
- Quarter 11** 5 261, Engineering Economy and Decision Theory, technical elective, liberal elective, open elective

## MECHANICAL ENGINEERING

### CLASS OF '80

- Quarter 4** 2 165, Mechanics I, 10 153, Calculus, 11 206, Physics for Engineering Students IV, 11 110, Physics Laboratory for Engineering Students I, 39 115, Principles and Problems of Economics

- Quarter 5** 2 167, Mechanics III, 10 154, Calculus, 2 130, Thermodynamics I, 11 111, Physics Laboratory for Engineering Students II, liberal elective

### CLASS OF '79

- Quarter 6** 2 166, Mechanics II, 2 131, Thermodynamics II, 2 192, Measurement and Analysis, 10 155, Mathematical Analysis
- Quarter 7** 2 155, Fluid Mechanics I, 2 196, Materials Science, 10 156, Mathematical Analysis, 2 168, Mechanics IV

### CLASS OF '78

- Quarter 8** Three electives, liberal elective
- Quarter 9** 2 150, Heat Transfer, 2 176, Dynamics, elective, liberal elective

### CLASS OF '77

- Quarter 10** Three electives, liberal elective
- Quarter 11** Three electives, liberal elective

# MECHANICAL ENGINEERING— Five-Year B.S.-M.S.

2.131, Thermodynamics II; 2.167, Mechanics III; 2.192, Measurement and Analysis; 10.155, Mathematical Analysis; liberal elective.

**Quarter 6**

2.155, Fluid Mechanics I; 2.196, Materials Science; 10.156 Mathematical Analysis, two liberal electives.

**Quarter 7**

2.826, Mathematical Methods for Mechanical Engineers I; three electives; liberal elective; graduate elective

**Quarter 8**

2.827, Mathematical Methods for Mechanical Engineers II; three electives, liberal elective, graduate elective.

**Quarter 9**

Graduate electives (8 Q.H.); electives (8 Q.H.); seminar

**Quarter 10A**

Graduate electives (8 Q.H.); electives (8 Q.H.); seminar

**Quarter 11S**

Graduate electives (4 Q.H.); electives (8 Q.H.); thesis

**Quarter 12**

## ENGINEERING TRANSFER PROGRAM

### TRANSFER STUDENTS WITH ASSOCIATE DEGREE IN ENGINEERING TECHNOLOGY

All majors take: 10.140, Calculus; 11.126, Physics; 9.104, Computer Programming plus additional course(s) by major. CIVIL, 1.140, Structural Mechanics I, MECHANICAL, 2.130, Thermodynamics I, ELECTRICAL AND POWER SYSTEMS, 3.119, Circuits and Systems A, INDUSTRIAL, 10.208, Probability

**Special Term  
Quarter 5T**

CIVIL, 10.155, Mathematical Analysis; 2.116, Dynamics; 2.130, Thermodynamics; 1.141, Structural Mechanics; MECHANICAL, 2.131, Thermodynamics II; 10.155, Mathematical Analysis; 2.164, Mechanics - Transfer; 2.195, Design of Experiments; ELECTRICAL AND POWER SYSTEMS, 10.155, Mathematical Analysis; 3.120, Circuits and Systems B; 3.101, Discrete Systems; 2.130, Thermodynamics; INDUSTRIAL follows regular curriculum.

**Special Term  
Quarter 6T**

ELECTRICAL AND POWER SYSTEMS, 10.156, Mathematical Analysis; 2.163, Mechanics for Electrical Engineers; 3.122, Circuits and Systems IV; 3.141, Electronics I; CIVIL, MECHANICAL AND INDUSTRIAL follow regular curriculum

**Special Term  
Quarter 7T**

## Lincoln College

### B.E.T. ELECTRICAL

- Quarter 4** 10 421, Calculus A, 3.451, Circuit Analysis I; 11.420, Physics IV (Electromagnetic Field), liberal elective.
- Quarter 5** 3 424, Circuits Laboratory I; 3.440, Physical Electronics, 3.452, Circuit Analysis II, 10 422, Calculus B, liberal elective.
- Quarter 6** 3 411, Electronics I, 3 425, Circuits Laboratory II; 3.453, Circuits Analysis III, 3 460, Engineering Analysis; and 39.115, Principles of Economics
- Quarter 7** 3 412, Electronics II, 3 423, Electronic Laboratory; 3.410, Electrical Measuremeants; 3.430, Energy Conversion, and 3.454, Circuits Analysis IV
- Quarter 8** 3 470, Digital Computers; 3 413, Electronics III; 3 427, Advanced Electronic Laboratory I, technical elective
- Quarter 9** 3 477, Control Engineering, 3 428, Advanced Electronic Laboratory II, technical elective; liberal arts elective
- Quarter 10** 3 478, Control Engineering II, 3 429, Advanced Electronic Laboratory III, technical elective; liberal arts elective.
- Quarter 11** 3 437, Distributed Systems; 3 461, Engineering Analysis II or 2 411, Mechanics A, technical elective; liberal arts elective

### B.E.T. MECHANICAL

- Quarter 4** 10 421, Calculus A, 2 411, Mechanics A, 9 464, Engineering Design Graphics IV, 2 431, Materials A
- Quarter 5** 2 414, Stress Analysis A, 2 412, Mechanics B, 10.422, Calculus B; 2 461, Machine Shop or a liberal elective.
- Quarter 6** 2 415, Stress Analysis B, 2.421, Thermodynamics A, 2.462, Mechanical Technology Laboratory I, 2 413, Mechanics C, 39 115, Principles and Problems of Economics.
- Quarter 7** 2 422, Thermodynamics B, 2 465, Heat Technology Laboratory I; 2 441, Fluid Mechanics A, and 3 420, Electricity and Electronics I
- Quarter 8** 2 417, Mechanical Design A, 2 463, Mechanical Laboratory II; 2 442, Fluid Mechanics B, technical elective, BA or Industrial elective
- Quarter 9** 2 418, Mechanical Design B, 2 464, Mechanical Laboratory III; 2 423, Thermodynamics C, technical elective, liberal elective
- Quarter 10** 4 481, Nuclear Technology; 2 466, Heat Laboratory, 2 424, Thermodynamics D, technical elective, liberal elective.
- Quarter 11** 2 467, Project Laboratory, two technical electives, liberal elective.

## College of Liberal Arts

The following models illustrate the kinds of curricula from which an upperclass student in the College of Liberal Arts may select his/her program. Since the College offers programs leading to two degrees in most majors— the Bachelor of Arts and the Bachelor of Science— students should discuss their academic needs and goals with counselors in the College to determine the program most appropriate for them.

Generally, the Bachelor of Science requires greater concentration in the major field of study. Requirements for the Bachelor of Arts degree include minimum "distribution requirements" (courses in the Humanities, Social Sciences, Science/Mathematics) and completion of a modern foreign language through the intermediate level.

Other programs available include an interdisciplinary major in Human Services which is described in the University *Bulletin* and an Independent Major, whereby a student may, with guidance, design his own major. Information about these and all other programs is available in the Dean's Office.

## COLLEGE OF LIBERAL ARTS JUNIOR-SENIOR HONORS PROGRAM

The junior-senior program provides an opportunity for honors work under the supervision of a faculty adviser during the last three quarters of the student's program. Individual departments design their own honors program. Such a program may call for participation in honors seminars, independent study, or a special research project culminating in an honors thesis.

Standards for eligibility in the honors program are:

- Minimum average of 3.0 through the seventh quarter

- No F's or I's

- No C's or D's in major field

- No D's in courses required for graduation outside of major field

With the approval of the major department and the Honors Committee, exceptions may be made.

During three of the four quarters preceding graduation, the honors participant must complete 12 quarter hours of honors work. No more than four quarter hours of honors work may be taken each term unless the Honors Committee grants special permission. Students must register in their departments for the appropriately numbered honors course for which they will receive a grade from their advisers at the end of each term. The Honors Committee and the student's major department will insist that the student's honors work remain consistently excellent. Should the work fall below standard, the program will be subject to review and possible termination.

Students are invited or may request to participate. Written application for this program is made on forms available in the LA office. This application is reviewed by the Honors Committee and approval is based on the merits of the individual proposal. For information regarding eligibility or completion of the application, a student should consult an adviser in the dean's office.

## AFRICAN-AMERICAN STUDIES

### Bachelor of Arts

25.250, 251, Foundations of Black Culture I and II; 25.100, 101, Science and Black Society I and II, 25.050, Educational Issues for Black Americans, 25.254, Black Community and Social Change; 25.210, Contemporary Problems in Black Society; 25.170, Economic Problems of Black Americans; 25.257, Field Seminar; 25.259, Directed Study for Senior Thesis; 23.241, African-American History; 30.267, 268, African-American Literature I and II.

In addition, students must consult the department for recommended electives.

Foreign language and distribution requirements

### Bachelor of Science

25.250, 251, Foundations of Black Culture I and II, 25.100, 101, Science and Black Society I and II, 25.050, Educational Issues for Black Americans, 25.254, Black Community and Social Change; 25.210, Contemporary Problems in Black Society; 25.170, Economic Problems of Black Americans, 25.257, Field Seminar; 25.259, Directed Study for Senior Thesis; 23.241, African-American History; 30.267, 268, African-American Literature I and II.

In addition, students must select a "career package" of eight to ten specialized courses in consultation with and approval of a departmental faculty adviser.

## ART HISTORY

### Bachelor of Arts

27.118, 119, History of Art I and II, two Studio courses; ten Art History electives, two History electives, one Music elective; one Philosophy elective.

Foreign language and distribution requirements

### Bachelor of Science

27.118, 119, History of Art I and II, two Studio courses, ten Art History electives, two History electives, one Music elective; one Philosophy elective.



**BIOLOGY**

18.124, Introductory Seminar in Biology (concomitant with 18.131); 18.131, General Biology; 18.132, Animal Biology; 18.133, Plant Biology; 18.134, Environmental and Population Biology; 18.135, Genetics and Developmental Biology; 18.136, Cell Physiology and Biochemistry (formerly Cell Biology), four Biology electives approved by departmental Advisory Committee.

Fundamentals of Mathematics or Calculus (one year); 11.171, 172, Physics for the Life Sciences I and II, 11.173, 174, Physics Laboratory for the Life Sciences I and II or 11.117, Physics for Science Majors I; 11.119, Physics for Science Majors III, 11.147, 149, Physics Laboratory for Science Majors I and III; 12.106, 107, General Chemistry I and II; 12.171, Analytical Chemistry, 12.144, 145, Organic Chemistry I and II

Foreign language and distribution requirements

18.124, Introductory Seminar in Biology (concomitant with 18.131); 18.131, General Biology; 18.132, Animal Biology; 18.133, Plant Biology; 18.134, Environmental and Population Biology; 18.135, Genetics and Developmental Biology; 18.136, Cell Biology and Biochemistry (formerly Cell Biology); 18.280, Senior Seminar; four Biology electives approved by departmental Advisory Committee.

Calculus (one year); 11.117, 118, 119, Physics for Science Majors I, II and III, 11.147 and 11.148 or 11.149, Physics Laboratory for Science Majors I and II or III; 12.106, 107, General Chemistry I and II; 12.171, Analytical Chemistry; 12.144, 145, Organic Chemistry I and II; two approved advanced Science electives

Foreign language requirement

**Bachelor of Arts**

**Bachelor of Science**

**CHEMISTRY**

12.103, 104, General Chemistry I and II, 12.110, The Chemical Elements; 12.105, Analytical Chemistry; 12.153, 154, 155, Organic Chemistry I, II, and III; 12.161, 162, 168, Physical Chemistry I, II, and III; 12.183, Principles of Experimental Chemistry; 12.179, Instrumental Analysis.

10.181, 182, 183, Calculus I, II, and III, 11.117, 118, 119, Physics for Science Majors I, II, and III, 11.148, 149, Physics Laboratory for Science Majors II and III.

Foreign language and distribution requirements

**Bachelor of Arts**

- Bachelor of Science** 12.103, 104, General Chemistry I and II, 12.110, The Chemical Elements; 12.105, Analytical Chemistry; 12.153, 154, 155, Organic Chemistry I, II, and III; 12.161, 162, 168, Physical Chemistry I, II, and III; 12.183, Principles of Experimental Chemistry; 12.179, Instrumental Analysis; 12.213, Inorganic Chemistry; 12.253, Identification of Organic Compounds; two advanced Science or Mathematics electives; one advanced laboratory or research course.
- 10.181, 182, 183, Calculus I, II, and II; 10.207, Differential Equations; 11.117, 118, 119, Physics for Science Majors I, II, and III, 11.148, 149, Physics Laboratory for Science Majors II and III

## DRAMA

- Bachelor of Arts** 29.109, Speech for the Theatre, 29.110, Voice and Articulation; 29.150, Elementary Acting I; 29.160, Concepts of Direction; 29.170, Scenic Production; 29.200, 201, History of the Theatre I and II; Theatre Practicum; eight Drama electives
- Eight quarter-hours Psychology or four quarter hours each Anthropology and Sociology
- Foreign language and distribution requirements
- In addition, the department recommends that a Physical Education skills course be elected each quarter
- Bachelor of Science** 29.109, Speech for the Theatre, 29.110, Voice and Articulation; 29.150, Elementary Acting I; 29.160, Concepts of Direction; 29.170, Scenic Production; 29.200, 201, History of the Theatre I and II, Theatre Practicum; eight Drama electives
- In addition, the department recommends that a Physical Education skills course be elected each quarter

## ECONOMICS

- Bachelor of Arts** 39.115, 116, Principles and Problems of Economics I and II, 39.250, 251, Statistics I and II, 39.255, Microeconomic Theory, 39.256, Macroeconomic Theory, six Economics electives
- 10.104, 105, Fundamentals of Mathematics I and II, four Social Science electives other than Economics
- Foreign language and distribution requirements.
- Bachelor of Science** 39.115, 116, Principles and Problems of Economics I and II, 39.250, 251, Statistics I and II, 39.255, Microeconomic Theory, 39.256, Macroeconomic Theory, 39.293, Introduction to Econometrics or 39.294, Problems in Economic Research, ten Economics electives.
- 10.104, 105, Fundamentals of Mathematics I and II, four Social Science electives other than Economics

ENGLISH

30.110, Literary Analysis of Poetry, 30.120, Introduction to Linguistics or 30.121, Foundations of the English Language, 30.170, 171, Survey of English Literature I and II, two American Literature Courses\*, 30.222 or 223, Chaucer I or II or 30.218, Medieval Literature\*, 30.250 or 251, Shakespeare\*, 18th Century English Literature or Period Figure Course\*; 19th Century English Literature or Period Figure Course\*; one Seminar\*, two English electives; 23.130, 131, England to 1688 and England since 1688

Foreign language and distribution requirements.

30.110, Literary Analysis of Poetry; 30.120, Introduction to Linguistics or 30.121, Foundations of the English Language; 30.170, 171, Survey of English Literature I and II, two American Literature Courses\*; 30.222 or 223, Chaucer I or II or 30.218, Medieval Literature \*, 30.250 or 251, Shakespeare\*; 18th Century English Literature or Period Figure Course\*; 19th Century English Literature or Period Figure Course\*; one Seminar\*, four English electives; 23.130, 131, England to 1688 and England since 1688

Distribution requirements as required for the Bachelor of Arts program.

\*The Seminar may be substituted for a period or figure course thus adding one English elective

Bachelor of Arts

Bachelor of Science

GEOLOGY

16.201, Physical Geology, 16.203, Physical Geology Laboratory, 16.202, Historical Geology; 16.204, Historical Geology Laboratory, 16.211, Descriptive Mineralogy, 16.212, Optical Crystallography, 16.213, Optical Mineralogy; 16.271, Geology Seminar; six Geology electives.

10.104, 105, Fundamentals of Mathematics I and II or 10.106, 107, Calculus I and II, 11.117 Physics for Science Majors I or 11.171, Physics for the Life Sciences I, 12.106, 107, General Chemistry I and II.

Foreign language and distribution requirements

16.201, Physical Geology, 16.203, Physical Geology Laboratory, 16.202, Historical Geology, 16.204, Historical Geology Laboratory; 16.211, Descriptive Mineralogy; 16.212, Optical Crystallography, 16.213, Optical Mineralogy, 16.271, Geology Seminar, eight Geology electives

10.105, 107, Calculus I and II or 10.150, 151, 152, Calculus I, II, and III; 11.117, 118, 119, Physics for Science Majors I, II, and III, 12.106, 107 or 12.103, 104, General Chemistry I and II, 12.105 or 12.171, Analytical Chemistry or 12.161, Physical Chemistry or 16.214, Geochemistry, two approved additional Science electives; six courses in the Humanities and/or Social Sciences.

Bachelor of Arts

Bachelor of Science

## HISTORY

### Bachelor of Arts

23 101, 102, Western Civilization I and II; 23 210, 211, United States to 1877, United States since 1877, 23 199, The Historian's Craft; ten History electives distributed according to departmental requirements

Foreign language and distribution requirements.

Recommended courses in the related Social Sciences.

### Bachelor of Science

23 101, 102, Western Civilization I and II; 23 210, 211, United States to 1877, United States since 1877, 23 199, The Historian's Craft, 12 History electives distributed according to departmental requirements.

One course in Introductory Statistics (e.g., 19 120, 21, 239, 39, 250); 93 113, Computers for the Social Sciences, three of the following: 39 115, Principles of Economics, 21 100, Introduction to Sociology, 20 100, Principles of Social Anthropology, 22, 110, Introduction to Politics, 19 105, Foundations of Psychology, 18 119, Environment and Man. (Substitutions only with approval of the chairman.)

## HUMAN SERVICES

### Bachelor of Arts

*Prerequisite Courses:* 19 105, 106, Foundations of Psychology I and II, 19 120, Statistics in Psychology or 21 239, Introduction to Sociological Statistical Analysis, 21 100, Introduction to Sociology, 22 111, Introduction to American Government; 39 116, Principles and Problems of Economics II, 50 166, Introduction to Human Service Professions, 50 167, Psychosocial Development.

*Core Courses:* 19 135, 136, 201, Personality I and II, Psychology of Abnormal Behavior or 19 135, 202, 203, Personality I and Abnormal Psychology I and II, 21 200, 201, Group Behavior - The Sociological Imagination or 29 107, Interpersonal Communication and 29 117, Group Discussion, ONE of these: 21 118, Population and Society, 21 145, Urban Society, 21 245, Community Analysis; 21 255, Sociology of Formal Organizations, 56 150, Introduction to Rehabilitation, 56 951, Medical Rehabilitation, 92 160, Social Welfare Problems, 92 166, Casework and Counseling or 53.804, Counseling

Approved four-course concentration, two supervised field courses

Foreign Language and distribution requirements

## INDEPENDENT MAJOR

### Bachelor of Arts

A student who can demonstrate that none of the established majors listed offers preparation for his/her professional goal may petition for an Independent Major. Before filing a petition, the student must discuss the aims and ideas of the proposed major with a counselor in the Dean's Office who will help make course selections and assign a faculty adviser. Each proposal is considered on its individual merits by a special committee. No student may be considered an Independent Major until the proposal submitted has been approved by the committee.

## JOURNALISM

38.101, 102, History and Principles of Journalism I and II; 38.103, 104, Fundamentals of Newswriting I and II; 38.105, 106, Techniques of Journalism I and II; 38.107, 108, Press and Society I and II

23.210, 211, United States to 1877, United States since 1877; two History electives; 30.170, 171, Survey of English Literature I and II, two English electives; two Political Science electives; 39.115, 116, Principles and Problems of Economics I and II

Foreign language and distribution requirements

38.101, 102, History and Principles of Journalism I and II; 38.103, 104, Fundamentals of Newswriting I and II, 38.105, 106, Techniques of Journalism I and II, 38.107, 108, Press and Society I and II.

23.210, 211, United States to 1877, United States since 1877; 30.170, 171, Survey of English Literature I and II; two English electives, 39.115, 116, Principles and Problems of Economics I and II; six Mathematics and/or Science electives.

**Bachelor of Arts**

**Bachelor of Science**

## MATHEMATICS

10.181, 182, 183, Calculus I, II and III; 10.184, 185, Calculus and Linear Methods I and II, 10.186, 187, Differential Equations and Linear Methods I and II; four approved Mathematics electives selected in consultation with an adviser.

11.117, 118, 119, Physics for Science Majors I, II and III

Foreign language and distribution requirements

10.181, 182, 183, Calculus I, II and III, 10.184, 185, Calculus and Linear Methods I and II; 10.186, 187, Differential Equations and Linear Methods I and II, seven approved Mathematics electives selected in consultation with an adviser

11.117, 118, 119, Physics for Science Majors I, II and III; two non-science courses.

**Bachelor of Arts**

**Bachelor of Science**

## MODERN LANGUAGES

Eight advanced\* electives in the major language, two advanced\* electives in the minor language

30.170, 171, Survey of English Literature I and II, 23.101, 102, Western Civilization I and II, two additional History electives.

Distribution requirements.

Twelve advanced\* electives in the major language including two conversation and composition courses; six advanced\* electives in the minor language including two conversation and composition courses.

3.101, 102, Western Civilization I and II

Courses beyond the intermediate level

**Bachelor of Arts**

**Bachelor of Science**

## PHILOSOPHY

- Bachelor of Arts** 26.110, Classic Greek Philosophers, 26.111, Modern Philosophy; 26.150, Introduction to Logic or 26.151, Symbolic Logic; 26.152, Theory of Knowledge or 26.153, Metaphysics or 26.155, Moral Philosophy, one Philosophy seminar, eight Philosophy electives.  
Foreign language and distribution requirements.
- Bachelor of Science** 26.110, Classic Greek Philosophers; 26.111, Modern Philosophy; 26.150, Introduction to Logic or 26.151, Symbolic Logic; 26.152, Theory of Knowledge or 26.153, Metaphysics or 26.155, Moral Philosophy, one Philosophy seminar; eight Philosophy electives.

## PHYSICS

- Bachelor of Arts** 11.117, 118, and 119, Physics for Science Majors I, II, and III, and their associated laboratories 11.147, 148, and 149; 11.127, Intermediate Mechanics, 11.128, Electric and Magnetic fields; three upper-level Physics lecture courses; three upper-level Physics laboratory courses  
10.181, 182, and 183, Calculus I, II, and III; 10.184 and 185, Calculus and Linear Methods I and II, one advanced Mathematics elective.  
Foreign language and distribution requirements
- Bachelor of Science** 11.117, 118, 119, Physics for Science Majors I, II, and III, and their associated laboratories 11.147, 148, and 149; 11.127, Intermediate Mechanics, 11.128, Electric and Magnetic Fields; 11.208, Mathematical Physics; 11.220, Wave Motion and Optics; 11.230, Modern Physics, 11.200, Classical Mechanics; 11.211 and 212, Electricity and Magnetism I and II; three upper-level Physics laboratory courses  
10.181, 182, and 183, Calculus I, II, and III, 10.184 and 185, Calculus and Linear Methods I and II, two advanced Mathematics electives; five additional electives from those approved for majors in the following fields: Physics, Mathematics, Chemistry, Engineering, Biology, and Geology

## POLITICAL SCIENCE

- Bachelor of Arts** 22.110, Introduction to Politics, 22.111, Introduction to American Government, 22.112, Introduction to International Relations; 22.113, Introduction to Comparative Politics, 22.120, Conceptual Foundations of Contemporary Political Analysis\*, 22.121, Research Methods I\*\*, 22.261, Public Administration, 22.270, Political Theory or 22.273 and 274\*\*\*, Political Thought I and II; five Political Science electives

Six Social Science electives selected from at least three of the following areas: African-American Studies, Anthropology, Economics, History, Psychology, Sociology

Foreign language and distribution requirements

\*Replaces 22.280 and is a requirement for the BA degree beginning with Class of 1977

\*\*Replaces 22.281 and is a requirement for the BA degree beginning with Classes 1980A, 1980B, and 1979C

\*\*\*Political Thought II will count as an elective

22.110, Introduction to Politics; 22.111, Introduction to American Government, 22.112, Introduction to International Relations; 22.113, Introduction to Comparative Politics, 22.120, Conceptual Foundations of Contemporary Political Analysis\*, 22.121, Research Methods I\*; 22.122, Research Methods II\*; 22.261, Public Administration, 22.270, Political Theory or 22.273 and 274\*\*, Political Thought I and II; five Political Science electives.

Six Social Science electives selected from at least three of the following areas: African-American Studies, Anthropology, Economics, History, Psychology, Sociology

\*22.120, 121 and 122 replace 22.280, 281 and 286

\*\* Political Thought II will count as an elective

## **Bachelor of Science**

## **POLITICAL SCIENCE**

### **Concentration in**

### **Public Administration**

22.110, Introduction to Politics, 22.111, Introduction to American Government, 22.120, Conceptual Foundations of Contemporary Political Analysis\*, 22.121, Research Methods I\*\*, 22.122, Research Methods II\*\*\*, 22.260, Public Policy Analysis, 22.261, Public Administration, 22.266, Public Personnel Administration, 22.267, Public Budgeting and Fiscal Management, 22.270, Political Theory or 22.273 and 274\*\*\*, Political Thought I and II, two Public Administration electives

## **Bachelor of Science**

Six Social Science electives selected from at least three of the following areas: African-American studies, Anthropology, Economics, History, Psychology, Sociology

Replaces 22.280

\*Replaces 22.281

\*\*New requirement for degree beginning with Classes 1980A, 1980B and 1979C

Note: In view of guidelines for undergraduate Public Administration programs recently circulated by the National Association of Schools of Public Affairs and Administration, further interdisciplinary revisions are anticipated next year

## PSYCHOLOGY

### Bachelor of Arts

*Core courses:* 19 105, 106, Foundations of Psychology I and II (usually freshman), 19 120, 121, Statistics in Behavioral Science I and II (sophomore/middler); 19 149, Sensation and Perception I (freshman/sophomore); 19.164, Learning and Motivation (freshman/sophomore), 19 178, Physiological Basis of Psychology I (sophomore), 19 135, Personality I (middler); 19.155, Psychology of Language (middler)

At least three of the following laboratory courses: 19 160, Experimental Design, 19.165, Learning Laboratory; 19.162, Sensation and Perception Laboratory; 19 181, Laboratory In Physiological Psychology; 19.195, Laboratory in Psycholinguistics, 19.138, Experimental Personality; one Advanced Teaching Practicum; or Directed Study

At least four Psychology electives (a total of no more than two teaching practica will be accepted to meet departmental elective requirements).

At least one Psychology seminar

Psychology in Western Civilization, 23 102

Foreign language and distribution requirements.

### Bachelor of Science

*Core courses:* 19 105, 106, Foundations of Psychology I and II (usually freshman), 19 120, 121, Statistics in Behavioral Science I and II (sophomore/middler), 19 149, Sensation and Perception I (freshman/sophomore), 19.164, Learning and Motivation (freshman/sophomore), 19 178, Physiological Basis of Psychology I (sophomore), 19 135, Personality I (middler), 19 155, Psychology of Language (middler)

At least four of the following laboratory courses: 19.160, Experimental Design, 19 165, Learning Laboratory, 19 162, Sensation and Perception Laboratory, 19 181, Laboratory in Physiological Psychology; 19 195, Laboratory in Psycholinguistics; 19 138, Experimental Personality, one Advanced Teaching Practicum; or Directed Study

At least eight Psychology electives (a total of no more than four teaching practica will be accepted to meet departmental elective requirements)

At least one Psychology seminar

11 176, 177, Physics for Psychology I and II, four additional courses in Mathematics, Physics, Biology, or Chemistry

## SOCIOLOGY- ANTHROPOLOGY

### Concentration in Sociology

### Bachelor of Arts

*Preparatory Requirements:* 21 100, Introduction to Sociology and 20 100 Principles of Social Anthropology *Core Requirements:* 21 239, Introduction to Statistical Analysis, 21 240, 241, Research



Methods I and II; 21 280, 281, Social Theory I, and II, 21 270, Class, Power, and Social Change (preferably in senior year). *Elective Requirements:* one of the following 21 107, Social Psychology, 21 111, American Society, 21 120, Sociology of the Family or 21 145, Urban Society; two of the following 21 215, Collective Behavior; 21 231, Sociological Theories of Crime; 21 245, Community Analysis; 21 255, Sociology of Formal Organizations, 21 265, Sociology of Occupations; one advanced anthropology course.

Six electives in the Social Sciences other than Sociology-Anthropology.

Foreign language and distribution requirements

*Preparatory Requirements:* 21 100, Introduction to Sociology and 20 100, Principles of Social Anthropology. *Core Requirements:* 21 239, Introduction to Statistical Analysis, 21 240, 241, Research Methods I and II, 21 280, 281, Social Theory I and II, 21 270, Class, Power, and Social Change (preferably in senior year). *Elective Requirements:* one of the following 21 107, Social Psychology, 21 111, American Society, 21 120, Sociology of the Family or 21 145, Urban Society, two of the following 21 215, Collective Behavior, 21 231, Sociological Theories of Crime, 21 245, Community Analysis, 21 255, Sociology of Formal Organizations, 21 265, Sociology of Occupations, one advanced anthropology course

Six electives in the Social Sciences other than Sociology-Anthropology

Approved five-course specialization

## **Bachelor of Science**

## **Concentration in Anthropology**

*Preparatory Requirements:* 20 100, Principles of Social Anthropology and 21 100, Introduction to Sociology. *Core Requirements:* at least three of the following 20 130, Language and Culture, 20 135, Individual and Culture; 20 140, Evolution and Society; 20 160, Anthropology of the Family; 20 170, Culture in Transition 20 210, Tribal Society and Cultures, 20 214, Peasant Society and Culture. *Elective Requirements:* at least six additional anthropology courses, one sociology elective

Six electives in the Social Sciences other than Sociology-Anthropology

Foreign language and distribution requirements

## **Bachelor of Arts**

<b>Bachelor of Science</b>	<p><i>Preparatory Requirements:</i> 20.100, Principles of Social Anthropology and 21.100, Introduction to Sociology; <i>Core Requirements:</i> at least three of the following, 20.130, Language and Culture, 20.135, Individual and Culture, 20.140, Evolution and Society; 20.160, Anthropology of the Family; 20.170, Culture in Transition, 20.210, Tribal Society and Cultures, 20.214, Peasant Society and Culture. <i>Elective Requirements:</i> at least six additional anthropology courses; one sociology elective</p> <p>Six electives in the Social Sciences other than Sociology-Anthropology</p> <p>Approved five-course specialization</p>
----------------------------	---

## **SPEECH COMMUNICATIONS Group and Public Communication Concentration**

<b>Bachelor of Arts</b>	<p>29.105, Argumentation and Debate, 29.106, Speech Fundamentals, 29.123, Propaganda, 29.119, Explorations in Communication; 29.129, Introduction to Communication Skills, 29.115, Theories of Persuasion, 29.116, Persuasive Techniques, 29.107, Interpersonal Communications, 29.117, Group Discussion, seven Speech electives</p> <p>22.101, Introduction to Political Science I or 22.102, Introduction to Political Science II, 19.106, Foundations of Psychology II or 21.100, Introduction to Sociology, 19.130, Social Psychology</p> <p>Foreign language and distribution requirements</p>
<b>Bachelor of Science</b>	<p>29.119, Explorations in Communication; 29.129, Introduction to Communication Skills, 29.115, Theories of Persuasion, 29.116, Persuasive Techniques, 29.107, Interpersonal Communications; 29.117, Group Discussion, six electives to be chosen from the following: 29.127, The Mass and The Media, 29.105, Argumentation and Debate, 29.108, Business and Professional Speaking, 29.128, Contemporary Public Address, 29.110, Voice and Articulation, 29.111, Oral Interpretation, 29.112, Advanced Vocal Techniques, 29.114, Advanced Oral Interpretation; 29.140, Consultation Skills; 30.120, Introduction to Linguistics, 30.130, Introduction to Semantics, 26.150, Introduction to Logic</p> <p>*Two Social Science courses (beyond the introductory level)</p> <p>Liberal Arts distribution requirements</p> <p>*Selected courses, based upon the value to the student's goals</p> <p>Advisor approval necessary</p>

## **Personal Performance Concentration**

29.106, Speech Fundamentals; 29.110, Voice and Articulation; 29.129, Introduction to Communication Skills *or* 29.119, Explorations in Communication; 29.111, Oral Interpretation; 29.108, Business and Professional Speaking; 29.105, Argumentation and Debate; 29.112, Advanced Oral Techniques *or* 29.114, Advanced Oral Interpretation; 29.118, Communications in Education *or* 29.115, Theories of Persuasion; 29.116, Persuasive Techniques *or* Reader's Theatre; 29.290, Directed Study in Speech Communications; Speech elective

Foreign language and distribution requirements.

29.119, Explorations in Communication; 29.129, Introduction to Communication Skills; 29.110, Voice and Articulation; 29.111, Oral Interpretation; 29.118, Communications in Education *or* 29.115, Theories of Persuasion; 29.116, Persuasive Techniques *or* Readers' Theatre; 29.290, Directed Study in Speech; six electives to be selected from the following: 29.107, Interpersonal Communications; 29.127, The Mass and the Media; 29.105, Argumentation and Debate; 29.108, Business and Professional Speaking; 29.128, Contemporary Public Address; 29.117, Group Discussion; 29.112, Advanced Vocal Techniques; 29.114, Advanced Oral Interpretation; 29.140, Consultation Skills; 30.120, Introduction to Linguistics; 30.130, Introduction to Semantics; 26.150, Introduction to Logic

Liberal Arts distribution requirements.

At least four courses selected in consultation with major adviser and approved by the Speech Curriculum Committee on the basis of the value of the selected courses to the student's proposed goals.

B.S. candidates must complete 29.290, Directed Study in Speech.

### **Bachelor of Arts**

### **Bachelor of Science**

## College of Nursing

### ASSOCIATE DEGREE PROGRAM

<b>Quarter 4</b>	19 201, Psychology of Abnormal Behavior, 21 100, Introduction to Sociology, 81 101, Medical-Surgical Nursing or 82 101, Maternal and Child Health
<b>Quarter 5</b>	19 201, Psychology of Abnormal Behavior, 21 100, Introduction to Sociology, 81 101, Medical-Surgical Nursing or 82 101, Maternal and Child Health
<b>Quarter 6</b>	30 114, Introduction to Literature, 90 254, Professional Development for Nurses, 81 102, Medical-Surgical Nursing or 83 101, Psychiatric Nursing, elective
<b>Quarter 7</b>	22 177, American Political Process, 81 102, Medical-Surgical Nursing or 83 101, Psychiatric Nursing, elective.

### ASSOCIATE DEGREE PROGRAM FOR LICENSED PRACTICAL NURSES

<b>Quarter 4</b>	21 100, Introduction to Sociology, 22 177, American Political Process or elective, 81 102, Medical-Surgical Nursing or 82 101, Maternal and Child Health or 83 101, Psychiatric Nursing
<b>Quarter 5</b>	30 114, Introduction to Literature, 90 254, Professional Development for Nurses; History or an elective, 81 102, Medical-Surgical Nursing or 82 101, Maternal and Child Health or 83 101, Psychiatric nursing
<b>Quarter 6</b>	81 102, Medical-Surgical Nursing or 82 101, Maternal and Child Health, elective, or 83 101, Psychiatric Nursing

### BACHELOR'S DEGREE PROGRAM

<b>Quarter 4</b>	18 120, Basic Microbiology, 18 125, Human Physiology, 19 105, Foundations of Psychology I, 80 204, Nursing - Universal Needs.
<b>Quarter 5</b>	18 125, Human Physiology, 19 106, Foundations of Psychology II, 20 100, Principles of Social Anthropology, 80 205, Nursing - Common Problems I
<b>Quarter 6</b>	19 141, Growth and Development I, 21 100, Introduction to Sociology, 73 116, Pharmacodynamics, 80 207, Nursing - Common Problems II

19.130, Social Psychology or 21.107, Social Psychology, 19.142, Growth and Development II, 81.201, Medical-Surgical Nursing or 82.201, Maternal and Child Nursing or 83.201, Psychiatric-Mental Health Nursing.	Quarter 7
81.201, Medical-Surgical Nursing or 82.201, Maternal and Child Nursing or 83.201, Psychiatric-Mental Health Nursing; Humanities elective; elective.	Quarter 8
81.201, Medical-Surgical Nursing or 82.201, Maternal and Child Nursing or 83.201, Psychiatric-Mental Health Nursing, Humanities elective; elective.	Quarter 9
84.201, Public Health Nursing; two electives	Quarter 10
85.201, Contemporary Nursing; elective	Quarter 11

## College of Pharmacy and Allied Health Professions

### PHARMACY

<b>Quarter 4</b>	12 144, Organic Chemistry, 11 171, Physics for the Life Sciences I, 19 105, Foundations of Psychology I; 39 115 or 116, Principles and Problems of Economics
<b>Quarter 5</b>	12 145, Organic Chemistry, 11 175, Physics for the Life Sciences III, 21 100, Introduction to Sociology; 29 108, Business and Professional Speaking
<b>Quarter 6</b>	71.261, Pharmacy I, 73 202, Anatomy-Physiology; 93.151, General Biochemistry, elective
<b>Quarter 6A</b>	18 120, Basic Microbiology, 71 262, Pharmacy II, 72 270, Medicinal Chemistry/Pharmacology I, 73 204, Anatomy-Physiology
<b>Quarter 7</b>	72 230, Drug Analysis; 72 271, Medicinal Chemistry/Pharmacology II, 73 223, Clinical Biochemistry; elective
<b>Quarter 8</b>	71 263, Pharmacy III, 73 229, Pharmacology Laboratory I, 73 245, Introduction to Pathology, 72.266, Chemical Pharmacology II, professional elective
<b>Quarter 9</b>	71 264, Pharmacy IV, 72 267, Chemical Pharmacology III, 73 230, Pharmacology Laboratory II, 73 247, Toxicology, professional elective
<b>Quarter 10</b>	65 218, Public Health, 71 243, Pharmacy Jurisprudence, 71 253, Clinical Pharmacy, 71 283, Professional Practice I, 71 284, Professional Practice I, Laboratory, professional elective
<b>Quarter 10A</b>	71 245, Pharmacy Administration I, 71 253, Clinical Pharmacy, 71 284, Professional Practice I/Laboratory, 71 285, Professional Practice II, 71 286, Professional Practice II/Laboratory; 90 251, Placement Techniques, professional elective, general elective
<b>Quarter 11</b>	71 253, Clinical Pharmacy, 71 286, Professional Practice II/Laboratory, 71 287, Professional Practice III, professional elective

### FORSYTH DENTAL - ASSOCIATE DEGREE PROGRAM

<b>Quarter 4</b>	30 113, Freshman Writing
<b>Quarter 4A</b>	30 114, Introduction to Literature
<b>Quarter 5</b>	21 100, Introduction to Sociology

## MEDICAL LABORATORY SCIENCE

Group I take 12 144, Organic Chemistry, 18 143, Human Physiology I, 87 104 Basic MLS Microbiology, elective	<b>Quarter 4</b>
Group II take 12 171, Analytical Chemistry, 87 102, Basic MLS Hematology, 87 103, Basic MLS Immunohematology, Social Science elective, Humanities elective	
Group I take 12 171, Analytical Chemistry, 87 102, Basic MLS Hematology, 87 103 Basic MLS Immunohematology, Social Science Elective, Humanities elective	<b>Quarter 4A</b>
Group II take 12 144 Organic Chemistry, 18 143, Human Physiology I, 87 104 Basic MLS Microbiology, elective	
All take 12 145, Organic Chemistry, 18 144, Human Physiology II, 87 105, Basic MLS Chemistry, elective	<b>Quarter 5</b>
All take 18 135, Genetics and Development Biology, 11 171, Physics for the Life Sciences I, 87 106, MLS Instrumentation I, 87 120, Communications in the Health Sciences, elective	<b>Quarter 6</b>
All take 11 172, Physics for the Life Sciences II, 18 221, Introduction to Microbiology, 18 136, Cell Physiology and Biochemistry, elective	<b>Quarter 7</b>
Group I take 87 202, Hematology and Immunohematology, 87 111, Applied Study Microbiology or 87 112 Applied Study Hematology or 87 115, Applied Study Clinical Chemistry, 87 203, Medical Immunology and Serology, 87      , MLS Seminar or Undergraduate Research	<b>Quarter 8</b>
Group II take 87 205 Clinical Chemistry, 87 111, Applied Study Microbiology or 87 112, Applied Study Hematology or 87 115, Applied Study Clinical Chemistry, 87 204, Medical Parasitology, 87      , MLS Seminar	
87.201, Pathogenic Microbiology, 87 111, Applied Study Microbiology or 87 112, Applied Study Hematology or 87 115, Applied Study Clinical Chemistry, 87 190, Undergraduate Research, 87      Seminar	<b>Quarter 9</b>
Group I take 87 205, Clinical Chemistry, 87 111 Applied Study Microbiology or 87 112 Applied Study Hematology or 87 115 Applied Study Clinical Chemistry, 87 204, Medical Parasitology, 87      , MLS Seminar (Instrumentation).	<b>Quarter 10</b>
Group II take 87 202, Hematology and Immunohematology, 87 111, Applied Study Microbiology or 87 112 Applied Study Hematology or 87 115, Applied Study Clinical Chemistry, 87 203 Medical Immunology and Serology, 87      , MLS Seminar	
87 221, MLS Management, 87 226, Health Science Education 87 107, Laboratory Instrumentation, Biology elective, elective	<b>Quarter 11</b>

## MEDICAL RECORD ADMINISTRATION

- Quarter 4** 39 115, Principles and Problems of Economics I or 23 101, Western Civilization I, 18 114, Functional Human Anatomy I, 21.100, Introduction to Sociology, elective, Humanities or Science.
- Quarter 5** 39 116, Principles and Problems of Economics II or 39 130, Medical Economics or 23 102, Western Civilization II, 18.115, Functional Human Anatomy II 18 121, Introductory Microbiology; 29.108, Business and Professional Speaking or elective
- Quarter 6** 86 112, Foundations of Medical Science I; 86 107, Medical Terminology, 86 151 Medical Record Science I; 86 160, Introduction to Computer, 86 102, Hospital Law
- Quarter 7** 86 152, Medical Record Science II, 86.113, Foundations of Medical Science II, 86 163, Systems, 86 162, Principles of Mangement and Hospital Administration
- Quarter 8** 86 153, Medical Record Science III, 45 209, Organization Behavior I, 45 259, Business and Society; 86.262, Applied Medical Record Science I, 86 164, Special Topics elective
- Quarter 9** 86 154, Medical Record Science IV; 45 210, Organization Behavior II, 86 166, Applied Health Statistics, 86 257, Organization and Management of Medical Records Department I, 86 165, Special Topics elective
- Quarter 10** 86 258, Organization and Management of Medical Record Department II, 86 161, Quality Assurance; 86 169 Independent Study; 86 253, Applied Medical Record Science II, 86 254, Applied Medical Record Science III, 86 164, Special Topic electives.
- Quarter 11** 86 , Medical Computer Application 29 108, Business and Professional Speaking or elective, 86 157, Seminar in Medical Records 87 226 Health Science Education, 86 165, Special Topics elective

## RESPIRATORY THERAPY

- Quarter 4** 73 202, Anatomy and Physiology 86 226, Cardio-Pulmonary Physiology, 86 221 Introduction to Physical Therapy Care, 86 201, Professional Practice Laboratory I, Psychology or Sociology elective
- Quarter 4A** 73 204 Anatomy and Physiology, 86 227, Cardio-Pulmonary Disease 73 117, Pharmacology for the Respiratory Care Practitioner, 86 222, Introduction to Respiratory Care, 86 202, Professional Practice Laboratory II
- Quarter 5** 86 209 Clinical Practice I 86 223 Respiratory Care for Medical and Surgical Patients, 86 203 Professional Practice Laboratory III; 86 214 Clinical Seminar I Speech or Communication elective, Liberal Arts elective
- Quarter 6** 86 210, Clinical Practice II 86 224, Respiratory care for the Critical Patient, 86 204 Professional Practice Laboratory IV, 86.215, Clinical Seminar II, 86 112, Foundations of Medical Science I; 86 102 Hospital and Law Ethics
- Quarter 7** 86 225 Cardio-Pulmonary Laboratory Technology, 86 205, Cardio-Pulmonary Laboratory Practice, 86 170 Health Disease and Disability 87 109 Foundation of Clinical Laboratory, Liberal Arts elective



## Course Numbering Program

The number to the left of the decimal point indicates the academic department offering the course. The three digits after the decimal point differentiate the courses within the department.

Accounting	41.	Health Education	65.
African-American Studies	25.	History	23.
Allied Health Professions	86.-87.	Industrial Engineering	05.
Anthropology	20.	Interdisciplinary	93.
Art	27.	International Business	46.
Biology	18.	Italian	35.
Business General	49.	Journalism	38.
Chemical Engineering	04.	Latin	36.
Chemistry	12.	Management	45.
Civil Engineering	01.	Marketing	43.
Cooperative	90.	Mathematics	10.
Criminal Justice	92.	Mechanical Engineering	02.
Drama, Speech, and Communications	29.	Military Science	91.
Earth Sciences (Geology)	16.	Music	28.
Economics	39.	Nursing	80.-85
Education Foundation	50.	Pharmacy	71.-73.
Education Curriculum and Instruction	51.	Philosophy and Religion	26.
Education Speech and Hearing	55.	Physical Education	60.-62.
Education Rehabilitation	56.	Physical Therapy	64.
Electrical Engineering	03.	Physics	11.
English	30.	Political Science	22.
Finance and Insurance	44.	Psychology	19.
French	31.	Recreation	63.
German	33.	Russian	34.
Graphic Science	09.	Sociology	21.
		Spanish	32.
		Transportation	48.

Classes at Northeastern University are scheduled in different modules.

In assessing quarter weights for courses, the following statement applies:

*One quarter-hour of credit is equal to 50 minutes of instruction per week, plus two hours of preparation.*

## Civil Engineering

**1.101 Special Topics** (Prereq. Outstanding academic performance) 4 Q.H.  
An individual effort in an area within the field of civil engineering selected by the student and adviser with approval by the Department, resulting in a definitive report. Work to be performed in both Quarters 10 and 11, equivalent to two quarter-hours each quarter. Final grade to be awarded in Quarter 11.

**1.105 Civil Engineering Systems** (Prereq. 10.154) 4 Q.H.  
Introduction to system synthesis and optimization techniques. The course is designed primarily for civil engineering students interested in planning and management in the fields of construction, transportation, environmental and structural engineering. Topics include: calculus method, linear programming, network analysis, critical path scheduling, and dynamic programming.

**1.106 Applied Probability Theory for Civil Engineers** (Prereq. 10.154) 4 Q.H.  
The basic elements of probability theory and their use via the solution of various civil engineering problems encountered in fluid mechanics, construction management, struc-

tures, transportation, etc. Probability of events, random variables and distribution, derived distribution, expectation, and common probability models.

#### **01.116 Engineering Measurements**

4 Q.H.

The methods and instruments utilized to perform engineering measurements; errors and reliability; propagation of errors in computing; application to problems of land surveying, route surveying, and topographical, hydrographical, and construction surveys.

#### **01.117 Engineering Measurements Laboratory**

2 Q.H.\*

To be taken simultaneously with 01.116. Fieldwork problems to expand and reinforce the lecture material of 01.116.

#### **01.120 Fluid Mechanics I**

(Prereq. 01.140) 4 Q.H.

Fluid properties; fluid statics; flow concepts including conservation of mass, energy and momentum; closed conduit flow including friction; dimensional analysis; introduction to open-channel flow.

#### **01.122 Hydraulic Engineering**

(Prereq. 01.193) 4 Q.H.

Principles of hydrology, hydraulics of open-channel flow, design of water distribution systems, design of sanitary sewer and storm drainage systems, hydraulic machinery.

#### **01.134 Transportation Engineering**

(Prereq. 01.105) 4 Q.H.

The current technology and status of the various systems of transportation of people and materials, including highways, urban mass transit, railroads, air and water transport, conveyors and pipelines. Civil engineering considerations of planning, design, cost, construction, research needs, and environmental factors.

#### **01.135 Construction Engineering**

4 Q.H.

Organizational concepts of construction entities; interrelationship of engineer, architect, and contractor; cost management systems; planning and analysis of estimates; scheduling work utilizing computer methods; management and supervision of construction operations; quality control.

#### **01.136 Highway Engineering**

4 Q.H.

A course in highway design based upon traffic conditions. Elements of intersection design, geometrics of highway design, materials, permanent design, and construction are considered.

#### **01.140 Structural Mechanics I**

(Prereq. Freshman Physics) 4 Q.H.

Statics of particles and rigid bodies in two and three dimensions. Analysis of internal forces in trusses and beams. Centroids and centers of gravity of lines, area, and volumes. Moments of inertia of areas and masses.

#### **01.141 Structural Mechanics II**

(Prereq. 01.140) 4 Q.H.

Review of statics. Shear and bending moment diagrams. Mechanical properties of materials. Analysis of members subjected to torsion and axial loads. Analysis of beams in shear and bending; elastic and plastic theory. Compound stresses.

#### **01.142 Structural Mechanics III**

(Prereq. 01.141) 4 Q.H.

Transformation of stress and strain. Column buckling and theories of failure. Review of forces in beams and trusses. Influence lines for statically determinate structures. Deflection of trusses, beams, and frames. Utilizing the method of virtual work and moment-area propositions.

#### **01.143 Structural Analysis I**

(Prereq. 01.142) 4 Q.H.

Analysis of statically indeterminate structures utilizing the slope-deflection equations and moment-distribution. The system approach to flexibility using matrix notation is also treated.

#### **01.144 Structural Analysis II**

(Prereq. 01.143) 4 Q.H.

The analysis of all classes of structures by use of the system approach in stiffness and member approach encompassing both flexibility and stiffness completes the matrix analysis of structures. Influence lines for statically indeterminate structures.

- 01.145 Structural Analysis III** (Prereq. 01.144) 4 Q.H.  
Approximate methods of structural analysis. Analysis of cables. Elementary structural dynamics. Analysis of membranes and shells. Structures in architecture.
- 01.150 Concrete Design I** (Prereq. 01.141) 4 Q.H.  
Design of reinforced concrete elements by the working stress and ultimate strength methods; bending members and short columns.
- 01.152 Concrete Design II** (Prereq. 01.150) 4 Q.H.  
Design of reinforced concrete structural systems including continuous beams, frames, floors, and roofs. Prestressed concrete design theory and practice. Long columns of reinforced concrete.
- 01.160 Structural Design I** (Prereq. 01.141) 4 Q.H.  
Design of steel members subjected to tension, compression, bending, and combinations of loading. Introduction to plastic analysis and design. Design of connections, braced frames, and rigid frames.
- 01.161 Structural Design II** (Prereq. 01.160) 4 Q.H.  
Design of steel plate girders, bridges, composite construction in bridges and buildings. Additional types in plastic analysis and design. Design for lateral loads on high-rise buildings.
- 01.174 Foundation Engineering** (Prereq. 01.178, 01.179) 4 Q.H.  
Evaluation of site survey and boring data for foundations. Determination of soil bearing capacity, design of spread footings, pile and caissons foundations. Design of retaining walls and braced sheeting. Selected topics on settlements and slope stability.
- 01.175 Geotechnology** (Prereq. 01.180) 4 Q.H.  
Origin and composition of the earth's crust, identification of soil classes, engineering properties of soils, clay and rock mineralogy, geological mapping and exploration, earth movements, weathering, transportation of materials by wind and water.
- 01.178 Soil Mechanics** (Prereq. 01.140) 4 Q.H.  
Soil classification, soil-water phase relationships. Introduction to ground water seepage, consolidation theory, strength properties of soils, stress distributions in soils due to surface loads, lateral earth pressures, bearing capacity of shallow footings. Laboratory tests to identify soils and determine physical properties and soil behavior.
- 01.179 Soil Mechanics Laboratory** 2 Q.H.\*  
To be taken simultaneously with 01.178. Laboratory exercises in soil classification, seepage, shear strength, consolidation, and triaxial testing.
- 01.180 Materials** (Prereq. Freshman Chemistry) 4 Q.H.  
The fundamentals of the behavioral classification of materials, such as metals, polymer, colloids, glasses, and composites. Other topics will include the significance of phase transformations, visco-elastic behavior and corrosion mechanisms.
- 01.182 Experimental Methods in Engineering Mechanics** (Prereq. 01.141) 4 Q.H.\*  
Survey of experimental techniques and instrumentation; experimental determination of basic material properties for concrete, wood, metals, and other engineering materials. Introduction to model analysis.
- 01.193 Environmental Engineering I** 4 Q.H.  
An introduction to the nature and effects of environmental quality, including water quality, water supply, water and wastewater treatment, air pollution, and solid waste management. Interrelationships between the air-water-land complex are developed. Emphasis on engineering approach to management of the environment. Open to all engineering students.
- 01.194 Environmental Engineering II** (Prereq. 01.193) 4 Q.H.  
Fundamental physical, chemical, and biological phenomena of water and wastewater systems are covered in this course. Topics are treated from an engineering viewpoint. Topics include: physical characteristics, chemical and biological reactions within the water environments, and planning factors.

**01.195 Environmental Engineering III**

(Prereq. 01.122, 01.194) 4 Q.H.

The fundamentals of water and wastewater treatment design practice are covered in this course. Topics include: pumping, land disposal, treatment plant hydraulics, clarifiers, biological treatment units, sludge handling, chemical handling, and outfall design.

**01.196 Environmental Design**

(Prereq. 01.122, 01.194, 01.195 to be taken concurrently) 4 Q.H.

A series of design and environmental laboratory sessions selected to develop the fundamentals of environmental engineering practice, with emphasis in water and wastewater technology.

**01.197 Survey of Environmental Problems** (*Enrollment limited to non-engineers*) 4 Q.H.

Major topics: water, wastewater, air pollution, and solid waste, will be covered in the following format: What is the problem? Why does it exist? Effects of this condition. Abatement procedures. The interrelationship of environmental conditions is stressed and ecological considerations discussed.

**01.259 Air Pollution**

4 Q.H.

Theory and practice related to engineering management of air resources, microclimate and dispersion of pollutants, atmospheric chemistry, air pollution instrumentation, control of gaseous and particulate emissions, and design of air pollution control systems. Biological and chemical aspects of air pollution with emphasis on the toxicological aspects of the environment, physiological effects of aerosols, analysis of organic and inorganic constituents of the atmosphere, and rationale for establishment of air quality criteria and standards.

## Mechanical Engineering

**02.116 Dynamics** (*Not open to Mech. Eng. majors*)

(Prereq. 01.140) 4 Q.H.

Kinematics and kinetics of particles and rigid bodies, including work and energy.

**02.130 Thermodynamics I**

4 Q.H.

Thermodynamics is the study of the concepts of energy and energy interactions between material systems through the basic laws of thermodynamics. The concepts of energy are discussed, and the first law for the conservation of energy is set forth. A system is described, and its thermodynamic state is defined in terms of properties of substances. An energy analysis of various thermodynamic systems is presented in terms of entropy and the second law. Some consequences of the second law are discussed.

**02.131 Thermodynamics II**

(Prereq. 02.130) 4 Q.H.

The general thermodynamic relationships between properties of a substance are developed. The equation of state is discussed for liquids, gases, and magnetic substances. The characteristics of power and refrigeration systems are presented. The thermodynamics of nonreacting mixtures of gases, liquids, and solids is set forth with the development of the chemical potential and phase relationships included. Reacting mixtures are studied and the conditions for chemical equilibrium are outlined.

**02.132 Introduction to Combustion**

(Prereq. 02.130) 4 Q.H.

The basic knowledge necessary to understand combustion phenomena and its application to selected combustion problems. Fundamental principles of thermochemistry, kinetics of chemical reactions, and transport properties of gases are given. The conservation equations for reacting mixtures are discussed. Theories of the combustion of liquid droplets, laminar diffusion flames, and premixed laminar flames are presented.

**02.134 Direct Energy Conversion**

(Prereq. 02.130) 4 Q.H.

Direct energy conversion is concerned with means for converting heat directly into electrical energy. Included among the devices which accomplish this are magnetohydrodynamic power generators, thermionic emission converters, and fuel cells. The operating principles of these engines are presented, and performance calculations are made. A unified theory of energy conversion is discussed based upon the concepts of irreversible thermodynamics.

- 02.145 Design Fundamentals** (Prereq. 02.167) 4 Q.H.  
Engineering design analysis of dynamically loaded machine elements. Stress concentration, contact and impact stresses, thorough treatment of fatigue factors in design (combined loading and statistical considerations). Environmental factors in design, creep, temperature and atmosphere.
- 02.146 Mechanical Engineering Design** (Prereq. 02.145) 4 Q.H.  
Project using system approach, which involves all aspects of mechanical engineering: mechanics, thermodynamics, heat transfer, etc. This course is intended to correlate previous courses in optimal design of various mechanical systems. Problem areas investigated may include friction and power transmission devices, hydraulic systems, etc.
- 02.147 Engineering Design** (Prereq. 02.167) 4 Q.H.  
Intended for students who take only one course in design. Topics covered are stress concentration, fatigue and impact loading, lubrication, friction, and power transmission devices and optimum design.
- 02.148 Design and Analysis** (*Open to all seniors*) 4 Q.H.  
An interdisciplinary course. Project either analytical or experimental supervised by an interdisciplinary faculty. Examples of projects (e.g., trash disposal, underwater search and rescue).
- 02.149 Engineering Analysis** 4 Q.H.  
Equilibrium problems in systems with a finite number of degrees of freedom (i.e., as opposed to a continuous system), extremum techniques, methods of solving the resulting algebraic equations, examples of physical situations, equilibrium stresses in elastic structures, steady state temperature distribution, steady subsonic flow, electrostatic fields, and steady flow of direct and alternating current.
- 02.150 Heat Transfer I** 4 Q.H.  
Modes of heat transfer; steady state and transient conduction, one and two dimensions; exact, numerical and graphical techniques; electrical analogy; natural and forced convection, laminar and turbulent; radiation; change of phase heat transfer; condensation and boiling; heat exchangers.
- 02.155 Fluid Mechanics I** (Prereq. 02.167) 4 Q.H.  
Differential and integral formulations of mass conservation and the equations of motion and energy; control volume applications; elements of one-dimensional, steady compressible flow; introductions to boundary layer theory; dimensional analysis and similitude.
- 02.156 Fluid Mechanics II** (Prereq. 02.155) 4 Q.H.  
Velocity potential and stream functions; circulation and Kelvin's theorem; two-dimensional, steady irrotational incompressible flow; Karman-Pohlhausen method applied to two-dimensional boundary layers.
- 02.157 Fluid Machinery** (Prereq. 02.155) 4 Q.H.  
General principles of turbomachines; similitude and performance curves; specific speed; consideration of turbines, centrifugal pumps and impressors, axial pumps and compressors, regenerative pumps and turbines.
- 02.163 Mechanics** (*Open to Elect. Eng. majors*) 4 Q.H.  
The kinematics and kinetics of rigid bodies. Instantaneous equations of motion, work and energy, impulse and momentum.
- 02.164 Mechanics** 5 Q.H.  
Statics, kinematics, and kinetics for transfer students.
- 02.165 Mechanics I** 4 Q.H.  
The concept and vector representation of force, moment of force, position, displacement, velocity, and acceleration. Equivalent force systems. System modeling, particles and rigid bodies, free body diagrams. Equilibrium; the kinematics and kinetics of particles.
- 02.166 Mechanics III** (Prereq. 02.165) 4 Q.H.  
Continuation of 02.165, Mechanics I. The kinematics and kinetics of rigid bodies. Instantaneous equations of motion, work and energy, impulse and momentum.

**02.167 Mechanics II**

(Prereq. 02.165) 4 Q.H.

Stress and strain in a solid and their transformation properties; stress-strain relation for the linear elastic solid; yield criteria; determination of the stress and deformation of simple members under axial, torsional, and flexural loadings.

**02.168 Mechanics IV**

(Prereq. 02.167) 4 Q.H.

This course, dealing with the stress and deformation of slender members under flexural loadings, extends considerably beyond the simple shapes and loadings treated in 02.167. Stresses in symmetric members transmitting both shear and bending; bending of unsymmetrical beams; deflections due to bending by a variety of techniques; treatment of statically indeterminate problems; elastic stability of flexible columns.

**02.169 Intermediate Strength of Materials**

(Prereq. 02.167) 4 Q.H.

Application of the principles of the mechanics of elastic solids covered in 02.167 to a wide variety of situations of engineering interest. Energy methods; determination of the deformation and stress in curved members; pressure vessels, beams on elastic foundations, contact stresses; introduction to plastic analysis.

**02.171 Mechanical Vibrations**

(Prereq. 02.166) 4 Q.H.

One, two, and multi-degrees of freedom systems using classical, energy, Laplace, mobility, matrix, and computer techniques.

**02.172 System Analysis and Control**

(Prereq. 02.166) 4 Q.H.

Theoretical background for analyzing and designing a linear control system. System modeling, linear approximations and their limitations, transfer functions, and block diagramming. Applications of the Laplace transform. Transient and frequency response. Stability, frequency domain, and root locus techniques.

**02.174 Design for Space Applications**

(Prereq. 02.166) 4 Q.H.

Topics covered are: astronomical coordinate systems, gravitational and nongravitational forces on spacecraft, the motion of artificial satellites, and observational techniques. The feasibility of voyages outside the solar system, interplanetary and interstellar navigation, and the hazards of space are discussed.

**02.175 Analog and Digital Computer Techniques**

4 Q.H.\*

Analog and digital computers for both time- and displacement-based problems. Review of Boolean Algebra and Digital Logic. Applications. Study of software for digital computers. Discussions about hybrid computers.

**02.176 Dynamics**

(Prereq. 02.166) 2 Q.H.

An intermediate course in engineering mechanics. Topics treated are: central force motion, gyroscopic motion, dynamic stability, variational mechanics, and the principle of least action. The Lagrangian equation of motion is developed and applied to problems of the dynamics of particles and rigid bodies.

**02.192 Measurement and Analysis**

4 Q.H.\*

Principles of engineering experimentation and instrumentation (including the thorough introduction to the analog computer) stressed in lectures and in proper design of experiments to minimize experimental error and uncertainty. Tests on machines particularly suited to illustrate above and commensurate with students' academic background.

**02.193 Mechanical Engineering Laboratory**

(Prereq. 02.192) 4 Q.H.\*

Project-type experiments. Students choose, research, design, and manage experiments which are of particular interest to the group and which illustrate principles of thermodynamics, strength of materials, fluid mechanics, heat transfer, etc.

**02.194 Mechanical Engineering Senior Project**

(Prereq. 02.192) 4 Q.H.

A project may be of an analytical, design, or experimental nature. It must be approved by the faculty member under whom the student will work. A formal report must be submitted to the student's faculty supervisor at the end of the quarter.

**02.195 Design of Experiments**

2 Q.H.

The concepts related to experimental development, testing procedures, mechanical

measurements and report writing will be treated from a theoretical and practical approach.

**02.196 Materials Science** 5 QH.\*

Crystallography, structure of solids, imperfections in crystals, phase equilibrium, basic mechanisms of metal strengthening and mechanical behavior, and the effect of temperature on the structure and properties of materials (recrystallization, recovery, precipitation, rate processes).

**02.197 Mechanical Behavior of Materials** (Prereq. 02.196) 4 Q.H.

Elastic properties of materials, atomic basis for elastic constants, dislocation theory, plasticity of crystals and noncrystalline solids. Creep, fracture, fatigue.

**02.198 Materials Processing** (Prereq. 02.196) 4 Q.H.

Casting, joining, soldering, bracing, welding, mechanical forming, and conventional and nonconventional machining. The topics deal with metals and nonmetals.

**02.199 Materials Science** (*Not open to Mech. Eng. majors*) 4 Q.H.

Covers material in 02.196, but no laboratory work included.

**02.232 Engineering Materials** (Prereq. 02.196 or equiv.) 4 Q.H.

Thermodynamics of materials; phase equilibria ternary systems; reactions with environment, i.e. kinetics, oxidation, corrosion, etc.; materials design criteria and materials engineering case studies.

**02.233 Thermodynamics of Propulsion** (Prereq. 02.131) 4 Q.H.

Application of the physical principles of thermodynamics, fluid mechanics, and plasmas to the prediction of the behavior of propulsion devices. Air-breathing engines and rocket engines are discussed in detail, with emphasis on realistic applications to demonstrate how physical laws both describe and limit the performance of particular devices. An introduction to plasmas is given. The fundamentals of electrical rocket propulsion are included.

**02.236 Nuclear Engineering I** 4 Q.H.\*

Study of nuclear physics emphasizing atomic and nuclear structure, radioactive decay, and nuclear reactions, with particular attention to fusion and fission. Health physics, nuclear instrumentation, and the production and uses of radioactive isotopes. A general comparison of thermal, fast, and broader reactor types is made prior to a discussion of neutron interactions and their slowing down. The four-factor formula and diffusion equation are developed and applied to one-group theory for bare and reflected thermal reactors. Energy production and distribution within the core and flux shaping are discussed.

**02.237 Nuclear Engineering II** (Prereq. 02.236) 4 Q.H.

Development of two-group theory for thermal reactors and consideration of the physics and safety of fast reactors. Effect of reactivity change, either intentional or accidental, as well as changes due to temperature, fission product buildup, xenon buildup after shutdown, and fuel depletion discussed. Reactor design considerations on the interrelationship of reactor physics, reactor engineering control, distribution of power, fuel cycle management.

**02.258 Gas Dynamics** (Prereq. 02.130) 4 Q.H.

Derivation of the conservation laws of fluid flow, wave motion and Mach number, adiabatic flow, calculation of propulsion forces, adiabatic flow with friction, normal shock analysis, analysis of compressible flow with heating or cooling, moving and oblique shock waves.

**02.260 Heat and Mass Transfer** (Prereq. 02.150) 4 Q.H.

Review of heat, mass, and momentum transfer analogies; rate equations. Conduction problems in steady-state and transient-state for both heat and mass transfer with various constant and fluctuating boundary conditions in rectangular, cylindrical, and spherical coordinates solved by formal mathematics, difference (relaxation) techniques, and methods of analogy. Thermal stresses induced by nonuniform temperature distributions; heat transfer at high velocity and in rarefied gases; boiling heat transfer at temperature extremes, with forced and natural convection; phase change in bulk stagnant systems.

## Electrical Engineering

### 03.101 Discrete Systems

(Prereq. 10.153) 4 Q.H.

Historical review and future perspectives of discrete systems; representation of digital signals, quantization; introduction to digital filters, moving average filters; Z-transforms, inverse Z-transforms; recursive digital filters, stability considerations, steady-state and transient response; introduction to non-recursive techniques, the discrete Fourier transform, the fast Fourier transform; applications to computation of system transfer functions.

### 03.111 Circuits and Systems I

(Prereq. 10.153) 4 Q.H.

Circuit elements (linear, nonlinear, time-invariant, and time-varying) sources (independent and controlled), Kirchhoff's laws, Tellegen's theorem, Thevenin's theorem, network topology, mesh and nodal analysis.

### 03.112 Circuits and Systems II

(Prereq. 03.111) 4 Q.H.

Linearity and time-invariance, system function, forced and force-free response of networks and L.T.I. systems, singularity response, partial fraction expansion, "Pre-box" concept, and signal flow graphs.

### 03.113 Circuits and Systems III

(Prereq. 03.112) 4 Q.H.

Thevenin's theorem revisited, magnitude and phase plots, resonance, two-port networks, energy and power, and convolution.

### 03.122 Circuits and Systems IV

(Prereq. 03.113) 4 Q.H.

Basic concepts and techniques of linear system theory. Review of system theory in terms of the convolution integral; waveform representation in terms of the Fourier Series, Fourier Integral, and the bilateral Laplace Transformation; system concepts in terms of the system function and their application to filters and feedback systems.

### 03.131 E.E. Laboratory I-Measurements

(Prereq. 03.111) 2 Q.H.\*

Basic electrical measurements, report writing, use of standard laboratory instruments including digital voltmeters, oscilloscopes, and bridges.

### 03.132 E.E. Laboratory II-Circuits and Systems

(Prereq. 03.112) 2 Q.H.\*

Experiments tied in the Circuits and Systems courses, together with more work in measurements.

### 03.133 E.E. Laboratory III-Devices

(Prereq. 03.141) 2 Q.H.\*

Introduction to the analog computer, electro-optics, terminal characteristics of active devices.

### 03.134 E.E. Laboratory IV

(Prereq. 03.142, 03.161) 2 Q.H.\*

Analog computation, logic circuits, design and testing of active circuits, microwaves studies, control systems.

### 03.141 Electronics I

(Prereq. 03.122) 4 Q.H.

This first course in electronics stresses the significance of nonlinear active devices as related to the behavior of circuits and systems concerned with functions in the frequency domain. Linear models for diodes, and discrete and integrated circuit active devices are developed to cope with the d-c characteristics and incremental gain and impedances of such devices. The concept of ideal amplification is modified to stress the limitations imposed upon bandwidth and gain by impedance levels, noise, parameter variation, and distortion encountered with current active devices. Consideration is given to cascaded stages, composite two-part, hybrid, and nonhybrid configurations.

### 03.142 Electronics II

(Prereq. 03.141) 4 Q.H.

This course is a continuation of Electronics I. Consideration is given to various types of coupling for cascaded stages, with emphasis on the differential configuration as the heart of the generalized operational amplifier. The topic of feedback for single loop amplifiers emphasizes the concept of loop gain and its influence on gain, impedance levels, bandwidth, and stability. Consideration is given to both desirable and undesirable stability concepts. The topic frequency translation included AM, FM, and PM systems. Frequency selective amplifiers are considered on the basis of LC-tuned circuits and active filters.

\*Including lab.



**03.144 Electronics III**

(Prereq. 03.142) 4 Q.H.

This course is a continuation of Electronics II. Operational amplifiers are introduced with consideration given to their operation, limitations, and applications. Applications include linear functions in the frequency domain and analog arithmetic operations. The topic, digital circuits, is related to the basic structure of digital computers. Consideration is given to the fundamental operation of active devices, bipolar, J-FET's and MOS-FET's, as switches, digit gates, function generation, pulse and delay circuits, and memories. These fundamental operations are related to current integrated circuits, including MSI and LSI.

**03.151 E.E. Laboratory I-A**

(Prereq. 11.203) 1 Q.H.\*

Basic electrical measurements, report writing, use of laboratory instruments, including digital voltmeters, oscilloscopes, and bridges.

**03.152 E.E. Laboratory I-B**

(Prereq. 03.151) 1 Q.H.\*

A continuation of 03.151, E.E. Laboratory I-A.

**03.153 E.E. Laboratory II-A**

(Prereq. 03.152) 1 Q.H.\*

Experiments in conjunction with courses 03.111 and 03.112, Circuits and Systems I and II. Additional experiments in measurements.

**03.154 E.E. Laboratory II-B**

(Prereq. 03.153) 1 Q.H.\*

Continuation of 03.153—now tied in with courses 03.113 and 03.122, Circuits and Systems III and IV.

**03.155 E.E. Laboratory III-A**

(Prereq. 03.154) 1 Q.H.\*

Introduction to the analog computer, digital computers, logic circuits as well as experiments tied in with 03.141 and 03.142, Electronics I and II.

**03.156 E.E. Laboratory III-B**

(Prereq. 03.155) 1 Q.H.\*

Continuation of 03.155 with some experiments tied in with 03.161 and 03.162, Field Theory I and II.

**03.161 Electromagnetic Field Theory I**

(Prereq. 10.156, 11.207) 4 Q.H.

Definition and representation of scalar and vector fields. Coordinate systems; elements of vector calculus; definition of the concepts of gradient, divergence, curl, and the "del" operator; free-space electrostatics; definition of the electric field intensity; the scalar potential; solution to Poisson and Laplace equations; macroscopic model of dielectric materials; the electric polarization and the electric flux density vector; boundary conditions; Lorentz force; free space magnetostatics; magnetic vector potential and solution to the "vector" Poisson equation; macroscopic model of magnetic materials; magnetization and magnetic field intensity; boundary conditions.

**03.162 Electromagnetic Field Theory II**

(Prereq. 03.161) 4 Q.H.

Generalization of the Maxwell equations to the case of time-varying fields; Faraday induction law; wave equations and the plane wave solution; Poynting theorem and the concept of energy stored by the fields; reflection and refraction of plane waves; time harmonic wave equations for the scalar and vector potentials; time harmonic form of retarded potentials; radiation from dipole; motion of charged particles in fields; magnetoionic media; elementary discussion of plasma physics and M.H.D.

**03.174 Basic Power Circuits**

(Prereq. 03.112) 2 Q.H.

Balanced and unbalanced polyphase power circuits, harmonics, symmetric components, and application to the solution of fault conditions in power circuits.

**03.175 Electromechanical Dynamics**

(Prereq. 03.113, 03.162) 4 Q.H.

Review of Maxwell's equations and quasistatic approximations, electric and magnetic energy concepts, state variable formulation of electromechanical coupling. Applications to elementary energy conversion devices, singly and doubly excited magnetic devices with mechanical translational and rotational elements. Generalized rotating electromagnetic energy converters, circuit-model concepts, applications to selected extant rotating machines: i.e., commutator machines and a-c machines; dynamic response to various stimuli.

Including lab.

**03.176 Machines and Systems**

(Prereq. 03.174, 03.175) 4 Q.H.

A detailed investigation of the operating principles of synchronous machines, synchronous motor and generator power-angle characteristics, machine dynamics, machine and power system stability.

**03.177 Introduction to Electric Machinery**

(Prereq. 03.161) 4 Q.H.

Review of magnetic field, energy, and energy conversion concepts. Transformers and their circuit representations; application of energy conversion concepts to basic rotating machines and development of the Theory of Induction, synchronous, and d-c machines. Limitations in actual machines will be discussed.

**03.178 Transients in Electric Power Systems**

(Prereq. 03.177 and 03.222) 4 Q.H.

This course comprises an introduction to the response of various elements of a power network to the transients caused by lightning, switching, and faults. Some of the equipment to be considered in terms of transient response include: the transmission line, lightning arresters, fuses, transformers, and circuit breakers.

**03.183 Electrical Engineering I** (*Not open to Elect. Eng. majors*) (Prereq. 10.152) 4 Q.H.

Introductory course to electric circuit theory covering Kirchhoff's Laws, loop and nodal analysis, Thevenin's theorem, power and energy, exponential excitation and the system function.

**03.184 Electrical Engineering II** (*Not open to Elect. Eng. majors*) (Prereq. 03.183) 4 Q.H.

Properties and analysis of electronic devices, circuits, and systems; elements of control systems; principles of energy conversion. Emphasis on each topic determined according to major discipline.

**03.185 Power System and Controls**

(Prereq. 03.183) 4 Q.H.

Basic concepts of electromechanical energy conversion stressing the terminal characteristics and operation of d-c and a-c machines, elements of power distribution systems, and concepts of feedback control, with application to power systems and plant control.

**03.186 Basic Electrical Instrumentation**

(Prereq. 03.183) 4 Q.H.\*

Basic electrical measurement devices including ammeters, voltmeters, oscilloscopes, and bridges; instrumentation techniques such as direct measurement, comparative measurement, and analog methods. Application to nonelectrical disciplines is included.

**03.187 Modelling Techniques**

(Prereq. 03.183 and 03.184; also FORTRAN IV programming.) 4 Q.H.

Introduction to the concept of modelling techniques to represent physical, biological, and social systems; electrical analogs and use of analog computers; introduction to digital modelling and the use of digital computation.

**03.191 Introduction to Digital Computers I: Design and Organization**

(Prereq. 03.141) 4 Q.H.

Introduction to the basic components of the general organization of a stored-program digital computer; number systems and base conversions, machine presentation of binary numbers and characters, coding and flow charting; non-machine arithmetic in different bases, machine arithmetic in binary; storage of data sets and data flow within a computing systems; hybrid computation; decision tables, definition and properties of Boolean algebra, logic expression minimizations, analysis and synthesis in combinatorial logic; computer elements, micro-operation, sequences; organization of a commercially available stored-program computer; a large-scale batch-processing system.

**03.192 Introduction to Digital Computers II: Fundamentals of Computation Structures**

(Prereq. 03.191) 4 Q.H.

Formal forms of Boolean expressions; NAND/NOR and other two-level implementations (integrated circuit viewpoint); arithmetic and logic of speed-up techniques; analysis and synthesis of sequential switching logic circuits, pulse-mode, and level-mode sequential logic; memory structures, trends in memory system organization and speed capacity trade-offs,

addressing techniques and storage allocations; "atoms," "molecules," logic design and physical realization of the functional building blocks of automatic digital machines.

### **03.218 Control System Theory** (Prereq. 03.142) 4 Q.H.

Control system concepts; goals and basic components. Review of time and frequency domain techniques. Classical control system theory; error analysis for different type systems. Analyses of second- and third-order systems. Stability and relative stability using root locus and Nyquist diagrams. The Nichols chart. Compensation, application of computer technology to control systems analysis and design. State variable description of dynamic systems. The state equations and the fundamental analog realization of the standard equations. Solution of the state equations. Properties of the state transition matrix. Optimal systems. Introduction to sampled data systems. The Z-transform as an analog to the Laplace transform.

### **03.221 Electric Power Systems I** (Prereq. 03.174) 4 Q.H.

This course, along with that following it, is designed to give a broad view of the structure of those electric systems whose primary function is energy transfer, and especially those whose function is the transfer of large quantities of energy. The functions of the various system elements are described and their significant characteristics are investigated briefly. The interrelation between elements is treated.

### **03.222 Electric Power Systems II** (Prereq. 03.221) 4 Q.H.

A continuation of Electric Power Systems I. Problems such as voltage control, protection, economics, and planning which relate to the system as a whole. Taken with the previous course, it provides a general background for more intensive studies of electric power systems.

*NOTE: A student may take both electives in sequence or may take the first course only.*

### **03.224 Power Systems Seminar** (Prereq. 03.176) 4 Q.H.

Short reports on technical topics of current interest in power systems. Each student will prepare his first report in his tenth quarter for presentation in the eleventh quarter. Material may be drawn from library research, co-op projects or experimental work of the student's choosing. The second short report will be prepared and presented in the eleventh quarter.

### **03.233 E.E. Power Laboratory I** (Prereq. 03.174) 2 Q.H.\*

Experimental work with polyphase power equipment, power measurements, polyphase power rectification, steady-state and dynamic operation modes of polyphase induction motors, power transformers and symmetrical component analysis of unbalanced loading of transformers, analog computer.

### **03.234 E.E. Power Laboratory II** (Prereq. 03.233) 2 Q.H.\*

Experimental work with rotating machinery and systems; steady-state and dynamic modes of operation of the commutator and synchronous machines; system study involving synchronous machines; selected experiments in control systems; network analyzer studies.

### **03.237 Senior Project Laboratory I** (Prereq. 03.142, 03.162) 2 Q.H.\*

In this course students work with a faculty adviser on some term project, either experimental or theoretical.

### **03.238 Senior Project Laboratory II** (Prereq. 03.142, 03.162) 2 Q.H.\*

This course may be a continuation of the project started in 03.237 or it may be a new project. Again, the student works closely with a faculty adviser.

### **03.241 Selected Topics in Electronics** (Prereq. 03.142) 4 Q.H.

This course concerns: 1) the description and application of those electronic devices (e.g. thyristors, photodiodes, etc.) not covered in depth in the regular electronics sequence; 2) electronic subsystems (e.g., AFC, shift registers, etc.); 3) systems (e.g., navigation systems, telephone switching systems, etc.). Most of the presentations are made by the students on topics of their choice, but there are also lectures by the instructor as well as by invited speakers, both from within and outside the department.

\*Including lab.

**03.242 Theory and Technology of Semiconductor Devices I** (Prereq. 02.196) 4 Q.H.\*

This course comprises a closely coupled lecture and laboratory series. Topics covered include: technology and physics of the planar diffusion process, electronic properties of homogeneous semiconductors, inhomogeneities and junctions (Fermi potential diagrams, equilibrium at an abrupt discontinuity, and the behavior of a junction under applied bias), the junction transistor.

**03.243 Theory and Technology of Semiconductor Devices II** (Prereq. 03.242) 4 Q.H.\*

This course is a continuation of 03.242. Material covered includes: introduction to unipolar transistor action, introduction to surface effects, the MOS-FET, and a discussion of noise problems encountered in semiconductor devices.

**03.251 Communication Theory** (Prereq. 03.122) 4 Q.H.

Introduction to classical modulation theory, probability theory, and some recent developments in communication theory. Topics include: signal space concepts, AM and FM, pulse modulation, matched filter, autocorrelation function, sampling theorem, probabilistic description of signals, source entropy, and channel capacity.

**03.261 Wave Transmission and Reception** (Prereq. 09.106, 09.107) 4 Q.H.

Analysis of radiation, transmission, and reception of electromagnetic and acoustic waves using graphical and digital computer techniques. Design of distributed systems, antennas, microphones, loudspeakers, and sonar transducers.

**03.262 Advanced Topics in Electromagnetic Field Theory** (Prereq. 03.162) 4 Q.H.

This course is a continuation of the required courses in field theory. Topics covered include (but are not limited to): microwave and waveguide structures, careful development of electromagnetic energy and force concepts, and an introduction to radiation and antenna theory.

**03.281 Machine Language and Assembly Language Programming**

(Prereq. 03.191) 4 Q.H.

Study of the machine language and assembly language of a selected digital computer. Machine representation of numbers, characters, and instructions. Machine language programming; flow of control, relocatability, input/output instructions, addressing, and instruction modification. Symbolic assembly language; macros, literals, and pseudo-instructions. Several programming projects will be an integral part of the course.

**03.282 Programming Systems** (Prereq. 03.281) 4 Q.H.

Continuation of 03.281. Assemblers, searching and sorting techniques, macro-processors; loaders. High level languages and an introduction to their compilation. Introduction to operating systems. Programming projects will be an integral part of the course.

**03.285 Applied Discrete Analysis** (Prereq. 10.156) 4 Q.H.

Introduction to elementary number theory, modern algebra, combinatorial mathematics and discrete probability theory, including such topics as prime numbers, least common multiple and greatest common divisor, Euclid's algorithm, continued fractions, congruences, groups, rings, fields, Boolean algebra, combinations and permutations, generating functions, random variables and Markov chains. The material in this course is widely applicable to the field of computer science.

**03.292 Mathematical Techniques in Electrical Engineering I**

(Prereq. 10.156 or equiv.) 4 Q.H.

Definition and representation of a complex variable and of functions of a complex variable. Topics covered are: conformal mapping, singularities, Laurent series, residues, and contour integration. Applications of complex variable theory to Fourier theory, Hilbert transforms, conformal transformations in the analysis of linear systems and in electrostatics.

**03.293 Mathematical Techniques in Electrical Engineering II**

(Prereq. 10.156 or equiv.) 4 Q.H.

Matrix notation and development of matrix algebra. The solubility of sets of linear equations; determinants, linear transformations, invariance, quadratic forms and eigenvalues. II-

Illustrative applications of matrix techniques for the formulation and solution of problems drawn from the realm of circuit theory, probability theory, and engineering physics.

**03.295 Numerical Methods and Computer Applications** (Prereq. 09.106, 03.122) 4 Q.H.  
Presentation of numerical techniques used in solving scientific and engineering problems with the aid of digital computers. Topics covered include: modeling and simulation of deterministic and probabilistic systems, theory of interpolation, iteration methods, numerical solution of ordinary and partial differential equations, signal detection, and use of libraries of scientific subroutines. Representative problems are chosen for solution on a digital computer.

**03.296 Digital Techniques** (Prereq. 03.142, 03.191) 4 Q.H.  
The characterization of devices, circuits and integrated structures encountered in digital systems, digital data transmission, error rates and systems parameters, synchronous-asynchronous information processing techniques related to bulk and surface storage media. Digital system reliability, failure rates, redundancy techniques. Computer-aided design, testing of digital systems, timing considerations in digital systems.

## Chemical Engineering

**04.101 Chemical Engineering Calculations I** (Prereq. 12.115) 4 Q.H.\*  
Application of the fundamental laws of mass and energy conservation and equilibrium concepts to chemical and physical processes; economic considerations leading to optimal solutions. A computational laboratory is included to improve the facility of the student in handling sophisticated problems. Analog and numerical approaches are stressed where applicable.

**04.102 Chemical Engineering Calculations II** (Prereq. 04.101) 4 Q.H.  
Simultaneous application of energy and mass conservation laws coupled with equilibrium considerations to comprehensive problems selected from the chemical processing industries; both steady and unsteady state processes.

**04.106 Polymer Science and Engineering** (Prereq. 12.147) 4 Q.H.  
Acquaints the students with the nature of polymeric materials and their importance to the chemical industries and everyday life. Topics include polymer classification, composition, and structure; polymer synthesis, including the chemistry of step-reaction and chain polymerization and addition copolymerization; polymer rheology; commercial production.

**04.111 Chemical Engineering I** (Prereq. 04.102) 4 Q.H.  
The important unit operations of chemical engineering. Fluid mechanics, heat transfer, and evaporation.

**04.112 Chemical Engineering II** (Prereq. 04.111) 4 Q.H.  
A continuation of 04.111. Drying, distillation, absorption, and extraction.

**04.121 Transport Phenomena I** (Prereq. 04.112) 4 Q.H.  
Momentum transport in the flow of fluids. The mechanisms of momentum transport by molecular motion and eddy motion are described. Momentum transport in systems of engineering interest are analyzed in terms of these mechanisms.

**04.122 Transport Phenomena II** (Prereq. 04.121) 4 Q.H.  
Heat and mass transport in systems of engineering interest. The mechanisms of transport by molecular motion and convective motion are described and applied to a variety of elementary problems.

**04.123 Experimental Methods I** (Prereq. 04.112) 4 Q.H.\*  
Experimental engineering methods; basic measurements, design of experimental apparatus, laboratory report writing, design of experiments, and data accuracy are stressed. Suitable experiments are performed.

**04.124 Experimental Methods II**

(Prereq. 04.123) 4 Q.H.\*

A continuation of 04.123 with emphasis on the development of an experimental program, reduction of data, and presentation of results; use of computers in simulating experimental conditions and for constructing mathematical models.

**04.126 Chemical Engineering Thermodynamics**

(Prereq. 04.102, 12.167) 4 Q.H.

The first law and its application to batch and flow systems, heat effects in chemical and physical processes, thermodynamic properties, the second law, entropy, physical and chemical equilibria; emphasis on the fundamental principles and mathematical relationships and their application to the analysis and solution of a variety of engineering problems.

**04.131 Process Design I**

(Prereq. 04.122, 04.126) 6 Q.H.\*

The class participates in the process design of a chemical plant capable of producing a specified annual tonnage of a chemical when specific raw materials are available. The fundamentals of chemical engineering science, practice, analysis, and economics which have been studied in previous courses are used to prepare a report containing flow sheets, material and energy balances, designs of processing units, and cost estimates of the capital requirements for procuring, erecting, and operating the plant.

**04.132 Process Design II**

(Prereq. 04.131) 6 Q.H.\*

Each student or a small group of students designs a chemical plant to produce a specified annual tonnage of one or more chemicals with a specific feed stock. The techniques used in Process Design I are used by each student to prepare an individual process design report and cost estimate for the particular plant assigned.

**04.133 Projects**

(Prereq. Senior student and consent of Dept.) 6 Q.H.\*

Individual research related to some phase of chemical engineering. Open only to students selected by the department head on the basis of scholarship and proved ability.

**04.134 Projects**

(Prereq. 04.133) 6 Q.H.\*

A continuation of the research work undertaken in 04.133.

**04.135 Principles of Nuclear Engineering**

(Prereq. 10.156, 11.206) 4 Q.H.

Nuclear physics, nuclear fission, the nuclear chain reaction, reactor theory, radiation shielding, materials of construction, reactor instrumentation and control, separation of stable isotopes, chemical separation, processing and special techniques of nuclear engineering.

**04.136 Chemical Engineering Kinetics**

(Prereq. 12.167, 04.126) 4 Q.H.

Fundamental theories of a rate of chemical change including collision and transition state theory in homogeneous reacting systems; integral and differential analysis of kinetic data and a design of batch and continuous flow chemical reactors; catalysis theory and design of catalytic reactors.

**04.137 Mathematical Methods in Chemical Engineering**

(Prereq. 10.156) 4 Q.H.

Formulation and solution of problems involving advanced mathematical methods. The problems are taken from chemical and engineering studies of equilibrium and rate processes. Emphasis is placed primarily on the formulation step. However, numeric and analytic solution techniques for solving sets of algebraic equations and for solving ordinary and partial differential equations are discussed.

**04.138 Process Control Systems**

(Prereq. 10.155 or permission) 4 Q.H.

Introduction to the principles of automatic control systems. Emphasis on modeling, stability, and design of linear feedback systems for control of temperature, liquid level, and composition.

**04.141 Junior Honors Program**

(Prereq. Approval of Dept.) To be assigned.

Those students undertaking a Junior Honors Program may petition for two credits for the research problem undertaken.

**04.142 Introduction to Optimization**

(Prereq. 10.155) 4 Q.H.

Elementary optimization techniques are applied to problems encountered in the chemical processing industry. These techniques include gradient search, pattern search, linear and dynamic programming. A knowledge of differential calculus is required.

**04.143 Special Topics**

(Prereq. Senior standing) 4 Q.H.

Chemical engineering topics of interest to the staff member conducting the class are presented for study.

**04.144 Chemical Energy Economics**

(Prereq. permission) 4 Q.H.

The role of chemical energy resources—such as petroleum, natural gas, coal, and shale oil—in our economy is examined with reference to current journal information. Financial decision-making techniques are introduced and applied to the problems of production, transportation, and use of chemical energy resources. These techniques include capital cost estimation, rate-of-return analyses and optimum economic operation.

**04.145 Mass Transfer Operations**

(Prereq. 04.122) 4 Q.H.

Calculation and design methods used in processes involving mass transfer. Topics covered include vapor liquid equilibria for binary and multicomponent systems, multicomponent distillation, absorption and extraction. Emphasis is placed on methods and techniques involving digital computer computations.

**04.146 Introduction to Nuclear Power Engineering (E.E.)** (Prereq. 10.156, 11.207) 4 Q.H.

Course for Electrical Engineering Power Systems students. Introduction to nuclear engineering, fundamental concepts of nuclear power, nuclear reactors and power plants, radiation protection and safety. Supplementary laboratory experiments.

**04.147 Analysis of Chemical Processes**

(Prereq. 04.126, 04.136) 4 Q.H.

Methods and reactions used for making chemical products on a large scale. Topics covered include types of physical and chemical equilibria, flow sheet patterns, energy management, and catalytic and noncatalytic rate problems. A number of situations involving simultaneous application of the above topics in process analysis are studied.

**04.148 Management in the Chemical Industries**

(Prereq. Senior standing in engineering) 4 Q.H.

Principles of management as applied to the chemical process industries. Case studies are used wherever possible, and outside experts are scheduled to lead some of the seminar sessions.

**04.149 Kinetics of Polymerization Process**

(Prereq. 04.136, 12.148) 4 Q.H.

The mechanisms by which polymeric materials are assembled via chemical reaction. Reaction rate models based on these mechanisms are utilized to investigate the effect of reaction parameters on the chemical and physical structure of the polymeric product. The types of polymerization processes considered are free radical addition, condensation, and ionic polymerization.

**04.151 Chemical Engineering Mathematics**

(Prereq. 10.156) 4 Q.H.

Formulation and solution of problems involving advanced calculus as they arise in chemical engineering situations. Methods covered will include ordinary differential equations, series solutions, complex variables, Laplace transforms, partial differential equations, and matrix operations. Emphasis will be placed on methods for formulating the problems. It will be assumed that the student has been exposed to some of these topics in appropriate mathematics courses.

**04.152 Pollution Control in the Chemical Industries** (Prereq. Senior standing) 4 Q.H.

Provides chemical engineering students with basic fundamentals for handling environmental problems in the chemical process industries. Water quality requirements and industrial waste characteristics; wastewater treatment processes applicable to environmental engineering; biological treatment processes and equipment; comprehensive design problems involving biological and tertiary treatment; the economics of water treatment and reuse.

## Industrial Engineering

- 05.128 Work Design** 4 Q.H.\*  
Philosophy and principles of work design; use of graphic models such as process charts, operation charts, man-machine charts, etc. Work measurement techniques including stop watch, synthetic standard, and work sampling. Extensive use of projects.
- 05.129 Manufacturing Processes** 4 Q.H.\*  
Principles and techniques in processes for the manufacture of articles of commerce, with emphasis on process design and cost, and consideration of process control and automation; metal working, forming, machining, and bonding; job-shop tooling and techniques; plastics and rubber forming and extruding; textiles, paper, electronics, food processing, and other manufacturing operations. Principles and procedures to obtain optimum value in products, methods of revealing excessive costs; relationship of value analysis to design, manufacturing procurement, and installation.
- 05.130 Systems I** (Prereq. 10.154) 4 Q.H.  
Linear feedback systems and solutions for steady state in first-order systems. Integral and derivative control. Laplace transforms for continuous systems analysis and Z-transforms in discrete systems. Transfer functions.
- 05.131 Systems II** 4 Q.H.  
Continuation of Systems I with emphasis on applications; inventory, distribution, and information systems; introduction to simulation of large systems with digital computers.
- 05.145 Probabilistic Analysis for Engineers** (Prereq. Integral & Differential Calculus) 4 Q.H.  
Development of probability theory which underlies such engineering problems as inventory, queuing, and quality control. Probability theory presented axiomatically, with emphasis on sample space representation of continuous and discrete random variables. Material will cover standard distributions: i.e., normal, gamma, exponential, poisson, binomial, and others. Topics include expectation, transform techniques, change of variable.
- 05.147 Statistics I** (Prereq. 10.208) 4 Q.H.  
Definition of a statistic; distributions of random variables including normal, t, chi-square, F, poisson, binomial; estimation of parameters-point estimation by method of moments, maximum likelihood, Bayes estimates.
- 05.148 Statistics II** (Prereq. 05.147) 4 Q.H.  
Interval estimation, stating and testing hypothesis, linear regression, analysis of variance, applied topics such as reliability, quality control, decision theory from Bayes Rule.
- 05.149 Reliability and Quality Control** (Prereq. 05.147) 4 Q.H.\*  
Applied probability and statistical inference techniques are utilized in reliability analysis and quality control. Both theory and application are discussed in relation to the total quality assurance program.
- 05.150 Industrial Cost Control** 4 Q.H.  
Fundamental concepts of accounting, with emphasis on use of financial records for making engineering decisions. Study of financial statements of a firm. Contrast in usefulness of data from absorption costing vs. direct costing. Interpretation of variance accounts.
- 05.151 World Dynamics** 4 Q.H.  
Feedback analysis of industrial dynamics is used to set forth a dynamic computer model of world scope to include the interactions among population, capital investment, geographical space, natural resources, pollution, and food production. The interactions of these major sectors are studied by means of the computer, and various technological and political policies are tested and evaluated over spans of up to 250 years. The quality of life is suggested as a crucial factor in world equilibrium. *Computer programming experience not necessary.*
- 05.161 Operations Research I** 4 Q.H.  
Deterministic models including L.P. and duality, transportation and allocation, sensitivity and



post-optimality analysis. Network analysis including maximal flow, shortest route, and PERT; dynamic programming and recursive functional expressions; game theory.

**05.163 Operations Research II** (Prereq. 10.208) 4 Q.H.  
Stochastic models in O.R.; their analytical development and solution. Topics covered: queuing, models, deterministic and stochastic inventory models, Markov chains, sequencing.

**05.165 Production and Inventory Control** (Prereq. 10.208 or equiv.) 4 Q.H.  
Basic inventory models and inventory management systems. Single-stage and multi-stage systems and their dynamics. Production control and aggregate planning. Mathematical and heuristic approaches to aggregate scheduling. Cost structure and decision framework oriented analysis. Consideration of job-shop scheduling and dispatching problems.

**05.166 Facilities Design** 4 Q.H.\*  
Application of quantitative techniques such as queuing theory and engineering economy to problems involving facilities planning and materials handling. Basic graphical tools, models for plant layout, and laboratory projects.

**05.169 Advanced Topics in Operations Research** 4 Q.H.  
Topics to include duality, Khun-Tucker conditions, Lagrangian Techniques, static and dynamic stochastic decision processes, model formulation and analysis.

**05.170 Human Considerations in Engineering Design** 4 Q.H.  
An introductory level human factors course with emphasis upon the physiological and anthropometric bases of equipment and workplace design. Topics include: 1) thermal regulation and heat stress; 2) work and fatigue; 3) acceleration and whole body vibration stress; 4) ambient noise and auditory system damage; 5) body measurements and equipment design. As feasible, theory is related to student conducted experiments.

**05.171 Human Factors** 4 Q.H.  
Introductory level course with emphasis upon human sensory motor performance and information processing capabilities. Includes application to the design and performance of man/machine systems. Topics include: 1) function and performance of the visual and auditory senses; 2) concepts of information theory and signal detection theory; 3) cognitive channel capacity and selective attention. The course is built around a series of experiments which explore theories of human performance in skilled task execution.

**05.186 People in Organizations** (Prereq. Seniors only) 4 Q.H.  
The individual in the work environment. Work theory, motivation, and interpersonal relations based on the concepts of the behavioral sciences; structure and dynamics of organizations; problems of innovation; case studies for situational analysis to develop skill in applying behavioral concepts.

**05.187 Industrial Relations** 4 Q.H.  
Analysis of industrial relations and organized labor, with emphasis on the historical developments leading to their current status. Union organization and philosophy, interaction of management, government and labor, collective bargaining, the labor contract, the personnel function, and the engineer's role in industrial relations.

**05.190 Senior Project** 1 Q.H.  
A significant industrial engineering project executed independently by the student, culminating in a well-organized and well-written report to be submitted to his class adviser and reviewed by a faculty committee. No regularly scheduled classes. Pass/fail basis.

**05.201 Principles of Computation and Programming I** 4 Q.H.  
Review of algorithms, computers, and programming at the FORTRAN level. Machine language programming (instruction, execution and addressing techniques). Coding and representation of data and structure. Subroutines, input-output, and simultaneous operations. Assemblers and loaders. Introduction to list structures and data organization. Program debugging and verification. Survey of machines, devices, and languages.

**05.202 Principles of Computation and Programming II**

(Prereq. 05.201 or consent of instructor) 4 Q.H.

Computer and programming system organization. Continuation of machine language programming from 05.201. Operating systems and supervisors. Processing of lists, strings, arrays, stacks, trees, and graphs. Survey of storage and computation equipment. Concepts of time sharing and real time. Properties and characteristics of algorithmic, list, and string processing languages to engineering problems.

**05.240 Digital Simulation Techniques**

(Prereq. FORTRAN) 4 Q.H.

Design and construction of digital, discrete simulation models. Extensive use of FORTRAN and special simulation languages. Discussion of model logic and specification, testing, validation, and use. Several simulation projects using the Northeastern computer facilities.

**05.241 Management Information Systems**

(Prereq. 05.201) 4 Q.H.

Managerial applications of digital computers. The use of computers in information, decision-control systems. Information-based theories of management. Survey of information technology. Computer system basics. Cost and value of information. System design, analysis, equipment selection. Organizational implications.

**05.245 Basic Engineering Statistics** (*Not open to Industrial Eng. majors*)

4 Q.H.

Introduction to basic probability distributions, including the binomial and hypergeometric, exponential, poisson, and normal; laboratory data analysis; statistical test of hypotheses about central tendency and variability; curve fitting with least squares on engineering data.

**05.260 Engineering Economy**

4 Q.H.

The formulation of analytical techniques: i.e., rate of return, present worth, and annual cost. The application of these techniques to reach economical solutions to business and engineering problems involving design, selection, replacement, lease-buy-decisions, and decisions between multiple alternatives. Sensitivity analysis and basic probability are introduced in cases where uncertainty exists. Brief survey of sources and costs of capital, debt-versus-equity-financing, and leverage.

**05.261 Engineering Economy and Statistical Decision Theory**

(Prereq. 05.145 or 10.208) 4 Q.H.

The objective of the course is to familiarize the students with the theory and techniques of economic evaluation of investment project. Introductory steps in the analysis of investment proposals, time value of money, and cash flows; analysis of deterministic and stochastic cash flows in terms of present worth, annual cost, rate of return, and benefit/cost ratio. Decision tree for sequential decisions, criteria for decision making under uncertainty, utility theory, value of information, effect of accounting procedures and taxes on investment analysis. Case studies involving replacement, lease, engineering design, and public projects.

**05.267 Special Topics in Engineering** (Prereq. Seniors or consent of instructor) 4 Q.H.

A senior-level course based on the N.U. Management Game which integrates material from prior courses in Business or Engineering. Students learn to manage a simulated firm by making marketing, production and finance decisions with the aid of interactive Decision Support Programs. In addition to game play, lectures cover topics which include business policy, planning and control, inventory policy, capital budget and techniques for model building.

**05.290 Independent Study in Industrial Engineering**

1—4 Q.H.

For students usually in the senior year with high scholastic standing on advanced I.E. topics. Projects may be of an applied or theoretical nature; formal report submitted to student's project supervisor at the end of quarter.

## Engineering Technology

### MECHANICAL ENGINEERING TECHNOLOGY

**02.411 Mechanics A** (Prereq. 10.320, 11.317) 4 Q.H.  
Forces, moments, couples, statics of particles and rigid bodies in two and three dimensions. Distributed forces: external and internal. First moments and centroids. Analysis of structures: trusses, frames and machines.

**02.412 Mechanics B** (Prereq. 02.411) 4 Q.H.  
Friction, second moments and virtual work. Kinematics of particles: rectilinear and curvilinear motion of dynamic particles. Force, mass and acceleration, work, and energy.

**02.413 Mechanics C** (Prereq. 02.412) 4 Q.H.  
Impulse and momentum of particles. Kinematics and dynamics of rigid bodies: force, mass, and acceleration. Dynamics of rigid bodies: work and energy, impulse and momentum. Introduction to mechanical vibration.

**02.414 Stress Analysis A** (Prereq. 02.411) 4 Q.H.  
Stress and deformation, mechanical properties of materials, allowable stresses and factors of safety, axially loaded indeterminate members, effects of temperature on stresses and strains, thin cylinders and spheres. Riveted and welded joints. Shear and bending moment in beams, stresses in beams, design of beams, curvature of beams.

**02.415 Stress Analysis B** (Prereq. 02.414) 4 Q.H.  
Determinate and indeterminate beam deflections and reactions by numerical and graphical integration and area moment methods; theorem of three moments. Torsional stresses and strains; power transmission; eccentric loads on struts, beams, riveted and welded joints; combined and principal stresses; Mohr's circle; theories of failure.

**02.416 Stress Analysis C** (Prereq. 02.415) 4 Q.H.  
Curved beam, non-symmetrical bending of beams, short-center and shear stresses on thin sections, composite beams. Columns, energy absorption and resilience, inertial stresses, impact loading, deflection of beams by energy methods. Bolted fastenings.

**02.417 Mechanical Design A** (Prereq. 02.415) 4 Q.H.  
Failure criteria, properties and selection of materials, manufacturing considerations, stress concentrations, strength under combined stresses, theories of failure, impact and fluctuating and repeated loads. Stresses, deformation and design of springs; screws, keys, pins and interference fits; preloading of bolted joints; shafts and flywheels; friction brakes.

**02.418 Mechanical Design B** (Prereq. 02.417) 2 Q.H.  
Lubrication and journal bearings; antifriction bearings; stresses and power transmission of spur, bevel, and worm gear; screws for power transmission.

**02.421 Thermodynamics A** (Prereq. 11.318) 4 Q.H.  
General theory of heat and matter, laws of thermodynamics, energy-transformation principles and availability of energy, properties and processes for pure substances and ideal gases. Thermodynamic properties and processes of liquids and vapors, tables and charts, mixtures of fluids, vapor cycles.

**02.422 Thermodynamics B** (Prereq. 02.421) 4 Q.H.  
Theory of vapor engines and analysis of types of actual engines using compression of gases and vapors; internal combustion engines. Theory of gas and vapor flow through orifices and nozzles. Principles of gas compression, analysis of vapor compression, refrigeration systems, low-temperature refrigeration cycles and absorption refrigeration systems.

**02.423 Thermodynamics C** (Prereq. 02.422) 4 Q.H.  
Air-conditioning principles including psychometrics and heat pumps. Calculation of heating and cooling loads in accordance with A.S.H.R.A.E. practices. Design and performance of steam and gas turbines; spark-ignition and compression-ignition engine design and performance. Fan performance.

**02.424 Thermodynamics D**

(Prereq. 02.422) 2 Q.H.

The primary modes of heat transfer; thermal conductance/resistance concept; thermal-electrical analog; combined heat transfer mechanisms; basic equations of conduction; thermal conductivity. Analytical solutions of various steady state conduction problems.

**02.425 Thermodynamics E**

(Prereq. 02.424) 4 Q.H.

Dimensional analysis and similarity considerations, natural and forced convection, hydrodynamic and thermal boundary layers, log-mean temperature differences, overall heat transfer coefficients, applications to heat exchangers. Black body radiation; Kirchhoff's Law; emissivity and absorbance; radiation between simple bodies. Graphical and numerical methods applied to steady state, conduction problems; radiation and convection effects; transient heat transfer; numerical methods applied to transient problems; heat transfer engineering problems.

**02.431 Materials A**

4 Q.H.

Lectures on fundamental metallic structures; general metallurgical information covering theoretical aspects of properties, testing, and failure of metals. Supplemented by visual aids. Lectures on alloying and hardening of metals, refinement of metals, equilibrium diagrams, characteristics of engineering metals, principles of metal fabrication.

**02.432 Materials B**

(Prereq. 02.431) 4 Q.H.

Inorganic materials, i.e., polymers, glasses, ceramics, cements, wood; and materials having important electrical and magnetic properties. Also a summary of the most recent applications for the fabrication and uses of both metals and nonmetals. Structures of metals, imperfections, phase diagrams, effect of temperature on structure and properties of metals (annealing, recrystallization, recovery, precipitation, diffusion), strengthening mechanisms, mechanical properties of nonferrous metals. Laboratory: experiments in preparation of samples, selection, polishing, and etching; examination of nonferrous metals, use of the microscope, linear analysis, construction of cooling curves, and simple binary phase diagrams.

**02.433 Applied Metallurgy**

(Prereq. 02.432) 4 Q.H.

Lectures: mechanical properties of ferrous metals, the iron carbon diagram, high-temperature alloys, hardening methods, impact tests, effects of environment on metals. Manufacturing processes, methods of fabrication, limitations on the use of different materials and processes, casting, welding, cutting, drawing, powder metallurgy. Laboratory: experiments on analysis of stress-strain diagrams of iron and steel, heat treatment of steels, surface corrosion, tempering and drawing, use of metallograph and analysis of the results. Experiments in cold rolling, swagging, drawing of nonferrous metals and the analysis of the results. Tension, shear, fatigue, and machinability tests on ferrous metals.

**02.441 Fluid Mechanics A**

(Prereq. 02.412) 4 Q.H.

Hydrostatics, principles governing fluids at rest, pressure measurement, hydrostatic forces on submerged areas and objects, simple dams, fluids in moving vessels, hoop tension. Fluid flow in pipes under pressure, fluid energy, power and friction loss, Bernoulli's Theorem, flow measurement.

**02.442 Fluid Mechanics B**

(Prereq. 02.441) 2 Q.H.

Pipe networks and reservoir systems; flow in open channels; uniform flow; energy, friction loss, minor losses, velocity distribution, alternate stages of flow, critical flow; nonuniform flow; accelerated and retarded flow; hydraulic jump and waves.

**02.451 Mechanical Vibrations**

(Prereq. 02.413) 4 Q.H.

Elements of vibrating systems; one degree of freedom (undamped free and forced vibration from Newton's law of motion and energy methods). Natural frequencies. Damped free and forced vibration. Impedance and mobility. Systems with more than one degree of freedom. Influence coefficients, Lagrange's equations, generalized coordinates, vibration absorber.

**02.452 Experimental Stress Analysis**

(Prereq. 02.415) 4 Q.H.

Theory and experimentation showing the application of extensometers and electrical strain gauges as transducers in the field of experimental stress and strain analysis. Theory and

laboratory practice; photoelastic methods as applied to classical model analysis and modern coating analysis.

**02.461 Machine Shop** 4 Q.H.  
Introduction to study of machines for metal processing, cutting tools, and fluids. Machinability; automatic machinery.

**02.462 Mechanical Technology Laboratory I** (Prereq. 02.431, 02.415, or concurrently) 2 Q.H.\*  
Experiments concerning the physical properties of materials. Instrumentation and measurement.

**02.463 Mechanical Technology Laboratory II** (Prereq. 02.462, 02.441) 2 Q.H.\*  
Experiments concerning compressible and incompressible fluids. Experimental techniques.

**02.464 Mechanical Technology Laboratory III** (Prereq. 02.463) 2 Q.H.\*  
Experiments of a more advanced nature. Introduction to the analog computer and experimental stress analysis.

**02.465 Heat Technology Laboratory I** (Prereq. 02.442 or concurrently) 2 Q.H.\*  
Experiments illustrating principles of thermodynamics and heat transfer. Instrumentation and measurement.

**02.466 Heat Technology Laboratory II** (Prereq. 02.465, 02.424, or concurrently) 2 Q.H.\*  
Experiments on various types of heat engines. Experimental techniques.

**02.467 Project Laboratory** (Prereq. 02.464, 02.466) 4 Q.H.\*  
A project of analytical, design, or experimental nature. Must be approved by student's faculty adviser. A formal report must be submitted.

## ELECTRICAL ENGINEERING TECHNOLOGY

**03.410 Electrical Measurements** (Prereq. 03.454) 4 Q.H.  
Measurement of voltage, current, power, resistance, capacitance, inductance, impedance, frequency, etc. Direct and substitution measurements. Evaluation of measured data, standard deviation and tolerance limits, instruments calibrations. Effects of residual impedance.

**03.411 Electronics I** (Prereq. 03.452, 03.440) 4 Q.H.  
Semiconductor diodes; power supplies and filters. Transistors as amplifying devices. Graphical analysis of basic amplifiers; d-c and a-c load lines. Transistor biasing techniques.

**03.412 Electronics II** (Prereq. 03.411) 4 Q.H.  
Small-signal, low-frequency transistor models. A-c equivalent circuits; low frequency amplifier circuits. Frequency effects in audio amplifiers. High-frequency transistor model. Voltage regulation.

**03.413 Electronics III** (Prereq. 03.412) 4 Q.H.  
Continuation of transistor circuits. Untuned amplifiers, feedback amplifiers and oscillators, low-frequency large signal amplifiers. Field effect transistor circuits.

**03.420 Electricity and Electronics I** (Prereq. 11.319) 4 Q.H.  
Introduction to circuit analysis, resistive networks, periodic excitation function, steady state a-c circuits. The physical foundations of electronics and the physical operation of electronic devices.

**03.421 Electricity and Electronics II** (Prereq. 03.420) 4 Q.H.  
Single-stage electronic circuits, magnetic circuits and transformers, electro-mechanical energy conversion, d-c machines, a-c machines.

**03.423 Electronic Laboratory** (Prereq. 03.412) 2 Q.H.\*  
Experiments dealing with laboratory equipment techniques, transistor and crystal-diode characteristics, the impedance bridge, the Q-Meter, coils with iron cores, filter circuits, vacuum and semi-conductor diodes, power supplies including the regulated type, triode and

\*Including lab.

pentode vacuum tubes, silicon-controlled rectifiers, resistance-coupled amplifiers. Transistor usage.

### **03.424 Circuits Laboratory I**

(Prereq. 03.451) 2 Q.H.\*

Experimentation in electronic circuit theory utilizing various measurement techniques. Instrumentation verification of circuit theorems; response of circuits to steps and impulses; oscilloscope theory and applications.

### **03.425 Circuits Laboratory II**

(Prereq. 03.424) 2 Q.H.\*

Further experimentation in electrical circuits and measurement techniques. Experiments include nonlinear devices, terminal characteristics of active devices, log modulus plots, network parameters and synthesis. Fourier analysis and synthesis.

### **03.427 Advanced Electronic Laboratory I**

(Prereq. 03.423, 03.413) 2 Q.H.\*

Experiments dealing with class B audio amplifier with transistors, push-pull amplifiers, drivers, and distortion measurements. Double-tuned transformers, video amplifiers, audio-frequency oscillators, and square-wave testing of audio amplifiers.

### **03.428 Advanced Electronic Laboratory II**

(Prereq. 03.427) 2 Q.H.\*

Experiments dealing with operational amplifiers. Modulation of class C amplifier, the diode detector, basic timing circuits, RF and crystal oscillators, networks in FM and television equipment, pulse and counter circuits and frequency dividers, sawtooth generators, astable (free-running) multivibrators, logic gates, frequency modulation detectors.

### **03.429 Advanced Electronic Laboratory III**

(Prereq. 03.428) 2 Q.H.\*

Spectral studies of FM and PM waves; amplitude limiters. The balance modulators and single sideband generators. Binary adders, registers and counters, radio receiver testing, television receiver demonstration, analog computers. Pulse forming and delay lines, slotted lines, a series of five microwave experiments, and a series of four digital experiments.

### **03.430 Energy Conversion**

(Prereq. 03.452 and 10.422) 4 Q.H.

Generalized theory of rotating energy conversion devices. Steady state operation of the multiply excited direct-current machine. control of speed; special machines. Steady state considerations of transformers; induction and synchronous machines. Generalized machine and circuit models, transfer functions, and flow chart analysis. Laplace transform techniques as applied to the analysis of dynamic operating modes of rotating machines.

### **03.437 Distributed Systems**

(Prereq. 10.422) 4 Q.H.

Radiation, transmission, and reception of electromagnetic waves. Distributed constants and traveling waves of transmission lines. Differential equations of the uniform line.

### **03.440 Physical Electronics**

(Prereq. 11.420) 4 Q.H.

Electron ballistics and applications. Properties of atoms and electrons as related to conduction of electricity in solids. Fundamentals of semiconductors, crystal diodes, and transistors. Theory of field-effect transistors, integrated circuits, and photoelectric devices.

### **03.451 Circuits Analysis I**

(Prereq. 10.320, 11.319) 4 Q.H.

Ohm's law, Kirchhoff's current and voltage laws, equivalent resistances and sources, mesh and modal analysis, network theorems, two-port networks and power relation—all with respect to direct currents. Energy storage, singularity functions; response of R, L, and C elements to singularities.

### **03.452 Circuits Analysis II**

(Prereq. 03.451) 4 Q.H.

Complex, algebra, phasors, frequency domain, mutual inductance, transformers, steady-state a-c theory, driving point and transfer impedances, power and energy in a-c circuits. Laplace transforms; partial fraction expansion; Laplace transform techniques applied to the solution of RLC networks.

### **03.453 Circuits Analysis III**

(Prereq. 03.452) 4 Q.H.

Application of differential equations to the solutions of linear, time-invariant electrical networks. Introduction to singularity function, convolution, and time domain transient analysis. Network topology and duality, introduction to the methods of transformation calculus and complex frequency concepts.

**03.454 Circuits Analysis IV**

(Prereq. 03.453) 4 Q.H.

Signal analysis in the frequency domain. Fourier series. Fourier and Laplace transform methods. A varied selection of circuit problems are solved using Laplace transforms and related theorems.

**03.460 Engineering Analysis I**

(Prereq. 10.422 and 03.452) 4 Q.H.

Linear algebra and its application to circuit equations. Solution of linear differential equations, including an introduction to Laplace transforms.

**03.461 Engineering Analysis II**

(Prereq. 10.422) 4 Q.H.

Complex variables and their relevance to an electrical engineering program.

**03.470 Digital Computers**

(Prereq. 03.313 or concurrently) 4 Q.H.

Introduction to the field of digital computer design. Topics include: general computer organization, number systems and number representations, design characteristics of major computer units, Boolean algebra applications to computer design.

**03.477 Control Engineering I**

(Prereq. 03.454 and 10.422) 4 Q.H.

Analysis of linear servomechanisms under both transient and steady state conditions. Signal flow graphs. Laplace transforms used in the formulation of block diagrams and transfer function.

**03.478 Control Engineering II**

(Prereq. 03.477) 4 Q.H.

System stability. Root locus techniques. Treatment of Nyquist criteria and Bode diagram methods for systems evaluation.

**03.490 Optical Instrumentation**

(Prereq. 10.308 and 10.319) 4 Q.H.

Telescopes, microscopes, and other optical instruments as optical system components. Includes magnification, aberrations, resolution criteria, photometry. Compatibility of system components and optimization of systems. The basic nonimage-forming systems used for analysis control and metrology.

## CHEMICAL ENGINEERING TECHNOLOGY

**04.481 Nuclear Technology**

(Prereq. 10.422 and 11.319) 4 Q.H.\*

Atomic and nuclear structure; discovery and nature of radioactivity. Nuclear reactions and energy, induced nuclear transformations, neutron properties, applications of radio nuclides. Radiological safety: nuclear instrumentation for particle detection, monitoring, and experimentation. The fission process and its applications; nuclear reactors—their classification design and application; nuclear fuel processing; radioactive waste disposal. Supplementary laboratory experiments.

## Graphic Science

**09.104 Computer Programming**

2 Q.H.

A special course offered primarily for engineering transfer students covering elementary programming methods using the FORTRAN language. Emphasis is on general programming, but examples are chosen from the various branches of engineering.

**09.106 Basic Engineering**

4 Q.H.

Introduction to engineering. Basic methods of communication (engineering drawing and pictorial representation). Use of the computer in engineering (FORTRAN programming). Input/output considerations, control statements including DO loops, subscripted variables.

**09.107 Basic Engineering**

(Prereq. 09.106) 4 Q.H.

Introduction to the design process. Involvement in original design projects requiring creative conceptual solutions. Review of several case studies showing the role of an engineer in problem solving. Continuation of computer programming as it applies in engineering. Use of the IBM Scientific Subroutine Package, computer graphics, numerical procedures.

Including lab.

**09.114 Introduction to Computers**

2 Q.H.

A course given for biomedical majors, covering elementary aspects of FORTRAN programming as it applies to solving medical and engineering problems. Subscripted variables and nested DO loops are covered.

**09.115 Computer Programming**

(Prereq. 09.114) 2 Q.H.

Higher-level programming techniques are developed, including writing of subprograms and making use of scientific subroutine packages. Graphical output using the CalComp plotter is covered.

**09.421 Principles of Computer Programming I**

2 Q.H.

Rules for forming simple FORTRAN programs. Basic input/output techniques. FORMAT control. Algorithms for solving simple scientific problems. Computing large sums; maxima and minima in both discrete and continuous cases.

**09.422 Principles of Computer Programming II**

(Prereq. 09.421) 2 Q.H.

Extended capabilities of the FORTRAN language. Manipulation of vectors and arrays. Subroutine and function subprogramming. Continued applications of computers, sorting, merging, root determination. A-Format.

**09.423 Principles of Computer Programming III**

(Prereq. 09.422) 2 Q.H.

Use of scientific subroutines, simulation, random numbers. Introduction to numerical methods (solution of simultaneous equations, quadrature, derivatives). Use of plotter language. Display of information.

**09.461 Engineering Design Graphics I**

2 Q.H.

Introduction to engineering drawing. Orthographic projection and primary auxiliary views. Reading and interpreting of multiview drawings. Isometric and oblique pictorial representation.

**09.462 Engineering Design Graphics II**

(Prereq. 09.461) 2 Q.H.

Emphasis on engineering drawings required to support engineering design, including standard conventions, dimensional and basic production processes. Shop detail drawings are covered. Exercised in design processes are given through selected projects and case studies.

**09.463 Engineering Design Graphics III**

(Prereq. 09.462) 2 Q.H.

Greater involvement in design by examination of many commonly used components. Case studies of large systems discussed in class. Advanced design projects assigned.

**09.464 Engineering Design Graphics IV**

(Prereq. 09.463) 4 Q.H.

Graphical analysis of kinematics elements. Displacement, locus generators, velocity vectors and sliding motion. Simple, compound, and reverted gear trains. Acceleration analysis mechanism such as cams and linkages. Functions and scales, nomographs. Introduction to self-connecting (feedback) systems.

## Mathematics

**10.100 Mathematical Preliminaries I (formerly Introduction to College Mathematics)**

4 Q.H.

A review of pre-college mathematics, primarily of arithmetic. Topics covered include operations with numbers, fractions, decimals, percents, graphs (pictographs, bar graphs, circle graphs, etc.) together with applications of these skills and concepts. The sequel of this course is 10.110.

**10.101 Basic Mathematics**

4 Q.H.

Development of real numbers and the algebraic operations, with emphasis placed on the field postulates. Study of polynomials, fractions, exponents, radical expressions, 1st- and 2nd-degree equations, solutions of inequalities.

**10.102 Basic Mathematics**

(Prereq. 10.101) 4 Q.H.

Functions and relations, graphs, simple forms of conic sections, variation, exponential and logarithmic functions, systems of equations and inequalities.



- 10.103 Basic Mathematics** (Prereq. 10.102) 4 Q.H.  
Complex numbers, theory of equations, sequences and series, probability.
- 10.104 Fundamentals of Mathematics** 4 Q.H.  
Review of algebraic equations and applications to work problems. Functions and graphs, equations of lines, slope, graphs of polynomials. Elementary trigonometry. Systems of linear equations and applications to work problems. Elementary probability.
- 10.105 Fundamentals of Mathematics** (Prereq. 10.104 or equiv.) 4 Q.H.  
Trigonometric, exponential, and logarithmic functions. Applications of logs to compound interest, population growth, radioactive decay, etc. Derivatives and slope. Product, quotient, and chain rules. Use of the derivative in sketching the graph of a function. Applications to maximum and minimum problems.
- 10.107 Calculus** (Prereq. 10.105) 4 Q.H.  
Review of differentiation. Antiderivatives and the integral. Techniques of integration. Areas, volumes of revolution, approximation, and applications to differential equations.
- 10.108 Probability, Statistics and the Computer** (*Non-Math majors*) 4 Q.H.  
A computer-oriented introduction to statistical methods, with applications in the life sciences. SPSS subroutine packages will be taught and used to handle problems in measurement of central tendencies, confidence limits, correlation and regression, and analysis of variance.
- 10.110 Mathematical Preliminaries II** (formerly **Introduction to College Algebra**) 4 Q.H.  
A survey of pre-college algebra, including linear equations, functions, graphing, factoring, exponents and radicals, logarithms, and some topics from trigonometry.
- 10.120 Introduction to Computers I** (*Non-Math majors*) (No Math. prereq.) 4 Q.H.  
A nontechnical introduction to computers, their abilities and shortcomings and their impact on learning society. Some of the questions to be raised are: Can computers think? How do computers compose music, play chess and write poetry? Can computers reproduce? How does a computer work? What can be done about the data bank menace? Although this is not a course in computer programming, the student will learn to convince (i.e., program) the computer to do simple tasks for him.
- 10.121 Introduction to Computers II** (Prereq. 10.120) 4 Q.H.  
Continuation of 10.120.
- 10.124 Fundamentals of Mathematics** 4 Q.H.  
Set theory; functions and graphs; linear and quadratic equations; exponents and logarithms; systems of linear equations; matrix algebra; systems of linear inequalities; linear programming. (Intended primarily for Business Administration students.)
- 10.125 Fundamentals of Mathematics** (Prereq. 10.124) 4 Q.H.  
Sequences; simple and compound interest; annuities; differential calculus, including differentiation of polynomials and exponential and logarithmic functions; maximum and minimum theory; integration; introduction to statistical analysis, including measures of central tendency and dispersion. (Intended primarily for Business Administration students.)
- 10.126 Mainstreams of Mathematics** 4 Q.H.  
Traces the development of mathematical thought by focusing on some of its most exciting concepts and their applications. Discussions, visual aids, mathematical games, and individual projects will supplement lectures and readings, enabling students with diverse backgrounds to rediscover mathematics. The level is nontechnical and no more than high school algebra and geometry is assumed. Topics covered vary from year to year but may include: Babylonian and Mayan mathematics; number systems, logic and computers; ancient Greek contributions to modern mathematics; calculus and the scientific revolution; maps, networks and topology; art, symmetry and modern algebra and geometry. The course can be used to satisfy the math-science distribution requirement but not any major requirement.
- 10.140 Mathematical Analysis IV-V** (Prereq. Freshman calculus or equiv.) 5 Q.H.  
Designed to prepare transfer students for numerical analysis and differential equations.

Linear algebra, vector-valued functions, functions of several variables, multiple integration, infinite series, Taylor's theorem, complex numbers.

**10.150 Calculus**

4 Q.H.

A first course in calculus of one variable, primarily for students in the College of Engineering. Review of functions, graphs, lines. Chain rule, curve sketching, maxima-minima, derivatives, limits, continuity, differentiation, integration and elementary applications.

**10.151 Calculus**

(Prereq. 10.150) 4 Q.H.

A continuation of 10.150. Possible topics may include differentiation, integration, first and second order differential equations, polar coordinates.

**10.152 Calculus**

(Prereq. 10.151) 4 Q.H.

Continuation of 10.151. Possible topics may include vectors, differential calculus of functions of several variables, vector calculus.

**10.153 Calculus**

(Prereq. 10.152) 4 Q.H.

Solid analytic geometry, vectors in 3-space, partial derivatives with applications, multiple integration.

**10.154 Calculus**

(Prereq. 10.153) 4 Q.H.

Improper integrals, infinite sequences and series, L'Hôpital's rule, power series, complex numbers.

**10.155 Mathematical Analysis**

(Prereq. 10.154) 4 Q.H.

Ordinary differential equations, with emphasis on methods of solution. Includes first-order equations, second-order linear equations with constant coefficients, and systems of first-order linear equations. Velocity, inverse differential operators, undetermined coefficients, linear equations. (Intended primarily for engineering students.)

**10.156 Mathematical Analysis**

(Prereq. 10.155) 4 Q.H.

*Part 1:* Introduction to numerical analysis. The digital computer is used in root-evaluation, interpolation and solution of differential equations. Laplace transform.

*Part 2:* Fourier series and boundary value problems for partial differential equations. (Intended primarily for engineering students.)

**10.160 Calculus for Biology Majors I**

4 Q.H.

A first course in calculus with inspiration from and applications to biology. Differentiation and integration of functions of one variable. Partial derivatives. Multiple integration, Taylor's formula, and approximation methods.

**10.161 Calculus for Biology Majors II**

(Prereq. 10.160) 4 Q.H.

Continuation of 10.160.

**10.162 Calculus for Biology Majors III**

(Prereq. 10.161) 4 Q.H.

Continuation of 10.161.

**10.170 Geometry**

(Prereq. a course in calculus) 4 Q.H.

Selected topics from advanced plane geometry in Euclidean style: i.e., collinear points, concurrent lines, duality, cross-ratio, harmonic division of segments, homogeneous coordinates, abridged notations, special theorems concerning points, lines, triangles, and circles (Euler, Desargues, Lemoine, Brocard, Brianchon, Feuerbach); the nine-point circle, inversion, reciprocation.

**10.181 Calculus I**

5 Q.H.

Primarily for mathematics, physics, and chemistry majors. Derivatives and integrals of functions of one variable. Applications to curve sketching, maxima and minima problems, area, moments, etc. Approximation methods including numerical integration, Newton's method, Taylor series, and power series. By the third quarter, students will be required to solve selected problems on the computer.

**10.182 Calculus II**

(Prereq. 10.181) 5 Q.H.

Continuation of 10.181.

- 10.183 Calculus III** (Prereq. 10.182) 5 Q.H.  
Continuation of 10.182.
- 10.184 Calculus and Linear Methods I** (Prereq. 10.183) 4 Q.H.  
Methods of calculus combined with vector analysis, used to study curves, surfaces and functions of several variables. Topics include: parameterization of lines and planes, tangents and normal vectors, partial derivatives, maxima and minima problems, linear approximation, and tangent planes. Some linear algebra.
- 10.185 Calculus and Linear Methods II** (Prereq. 10.184) 4 Q.H.  
Continuation of 10.184. Multiple integration, line integrals, and exact differentials; various forms of Stokes' Theorem. More linear algebra.
- 10.186 Differential Equations and Linear Methods I** (Prereq. 10.183) 4 Q.H.  
Ordinary differential equations and linear algebra. First order equations, higher-order linear equations, systems of equations. Linear algebra includes eigenvalues and eigenvectors.
- 10.187 Differential Equations and Linear Methods II** (Prereq. 10.186) 4 Q.H.  
Analysis of linear partial differential equation, (wave equations, heat equation and potential equation). Ordinary differential equations with boundary values, Fourier analysis, orthogonal functions. Also transform methods and other topics in ordinary differential equations.
- 10.207 Differential Equations (Non-Math majors)** (Prereq. 10.183 or equiv.) 4 Q.H.  
An introduction to first- and second-order differential equations, their solution by analytic, geometric and numerical methods and their application to problems in the physical and life sciences.
- 10.208 Probability I** (Prereq. 10.154 or 10.185) 4 Q.H.  
Probability functions for finite and infinite spaces; conditional probability and independence; discrete and continuous probability distributions for one or more random variables; expectation; moments; binomial, Poisson, and normal distributions; central limit theorem.
- 10.209 Probability II** (Prereq. 10.208) 4 Q.H.  
Selected topics including introduction to stochastic processes, with emphasis on Poisson processes and Markov chains.
- 10.211 Introduction to FORTRAN Programming I** 2 Q.H.  
This course covers the design of algorithms and their translation into computer programs, using the more elementary facilities of the FORTRAN language. Topics covered include: integer and real number computation; programs that repeat operations; programs that choose what actions they will perform and in what order; data input and output; use of arrays.
- 10.212 Introduction to FORTRAN Programming II** (Prereq. 10.211 or equiv.) 2 Q.H.  
Continuation of 10.211. A more in-depth coverage of the topics listed above along with: techniques of dividing the solution of large problems into smaller sub-tasks; writing of function and subroutine sub-programs; use and operations on logical variables; some character manipulation.
- 10.213 Introduction to FORTRAN Programming III** (Prereq. 10.212 or a working knowledge of FORTRAN) 2 Q.H.  
Covers the use of the features of the FORTRAN language to solve a variety of problems. Will include: methods to increase the efficiency of programs, sorting methods, game playing, advanced input and output techniques.
- 10.214 Computer Organization and Programming** (Prereq. 2 quarters of programming) 4 Q.H.  
A basic course in computer organization and machine language programming. The topics include: CPU and index registers, basic types of machine language instructions, programming in MIX, subroutines and macros, assemblers, loaders, elementary list-processing techniques. Students are required to program several short exercises in MIX and turn in a term project at the end of the course.

**10.215 Information Structures (formerly Compilers I)**

(Prereq. Ability to write assembly language programs, preferably in MIX) 4 Q.H.  
 Basic information structures; arrays, lists, stacks, queues, deques, trees, binary trees. Applications to nonnumeric computations and problems in compiler construction. Searching and sorting methods and their relative merits.

**10.216 Compilers**

(Prereq. Knowledge of assembly language programming and some knowledge of data structures) 4 Q.H.

Project: to write (pieces of) a compiler from a higher-level language in machine language. Lectures on the construction of a compiler-lexical scan, syntax scan, object code generation, symbol table management, object code optimization techniques.

**10.220 Mathematical Statistics**

(Prereq. 10.208) 4 Q.H.

Estimation of parameters, confidence intervals, hypothesis testing, regression, sampling distributions. Introduction to analysis of variance and statistical decision theory.

**10.221 Applied Analysis**

(Prereq. 10.187) 4 Q.H.

Selected topics chosen to show how mathematics is applied to interesting physical and biological problems. Methods chosen from ordinary and partial differential equations, calculus of variations, Laplace transforms, singular perturbations, special functions, dimensional analysis, and other techniques of applied mathematics.

**10.222 Applied Analysis**

(Prereq. 10.221) 4 Q.H.

Continuation of 10.221.

**10.223 Numerical Analysis**

(Prereq. Two years of calculus, FORTRAN programming) 4 Q.H.

A computer-oriented introductory course with emphasis on appreciation of the difference between the theoretical existence of a solution and its numerical calculation. The topics covered are: systems of linear equations, nonlinear equations, interpolation and approximation of functions. Students are required to program and analyze problems on a computer.

**10.224 Numerical Analysis**

(Prereq. 10.223) 4 Q.H.

A continuation of 10.223. Numerical differentiation and integration, solution of ordinary differential equations and other topics as time permits.

**10.226 Functions of a Complex Variable**

(Prereq. 10.184 or equiv.) 4 Q.H.

Algebra and geometry of complex numbers. Concepts of limit, continuity, and derivative in the complex domain. Holomorphic functions, series, contour integration. Applications.

**10.230 Linear Programming (Non-Math majors)**

(Prereq. One year of college mathematics) 4 Q.H.

Introduction to concepts and techniques of linear programming, game theory, stochastic processes. Applications to economics, social sciences, and other related fields.

**10.232 Multivariate Statistics**

(Prereq. 10.220) 4 Q.H.

Methods of classification, estimation, and prediction based on several statistical variables.

**10.240 Mathematical Models in the Life Sciences**

(Prereq. One year of calculus) 4 Q.H.

A course in the derivation and solution of mathematical models in the area of biology, psychology, and the social sciences. Such phenomena as population dynamics, diffusion processes, pollution, control systems, neural networks, and mathematical genetics are studied.

**10.241 Mathematical Models in the Life Sciences**

(Prereq. 10.240) 4 Q.H.

A continuation of 10.240.

**10.246 Linear Algebra I**

(Prereq. 10.187 or permission of instructor) 4 Q.H.

Vectors, vector spaces including function spaces, subspaces. Lengths, angles, scalar products. Volumes, determinants. Linear independence and dependence. Dimension. Linear and affine maps. Kernel and image. Algorithms: row operations, double triangular form, inversion. Introduction to study of what linear maps look like. In particular, characteristic

polynomials, eigenvalues, and eigenvectors in low dimensions.

*Note: Students who have not completed 10.181-187 should speak to the instructor of 10.246 and inform him or her of their background.*

**10.247 Linear Algebra II** (Prereq. 10.246) 4 Q.H.  
Detailed study of linear maps. Part I: Symmetric maps and quadratic forms. Isometries and skew-symmetric maps. Decomposition of general linear maps using symmetric maps and isometries. Part II: Polynomials evaluated on linear maps. Generalized eigenspaces. Jordan form. Then, as time permits, an introduction to computational methods with emphasis both on the geometry underlying algorithms and on practical advantages and limitations. Also, a survey of related areas in mathematics in which linear ideas play a role.

*Note: Upper-level students who have not completed the 10.181-10.187 program may take 10.246-10.247. Such students should see the instructor in the course and inform him of their particular background.*

**10.250 Analysis I** (Prereq. 10.187 or consent of instructor) 4 Q.H.  
The theoretical underpinnings of the calculus: limits, measure, continuity, and related concepts. Analysis I and II are intended to serve as a bridge between the 10.281-287 calculus sequence and the more advanced analysis courses such as 10.221-2, 10.226, and 10.264-5.

**10.251 Analysis II** (Prereq. 10.250) 4 Q.H.  
Continuation of 10.250. Once through the calculus again, armed with the concepts introduced in Analysis I.

**10.256 Algebra** (Prereq. 10.246) 4 Q.H.  
Theory of fields: field extensions, automorphisms, Galois theory. Applications to theory of equations.

**10.257 Optimization and Mathematical Game Theory**  
(Prereq. Some linear algebra, e.g., 10.246 or consent of instructor) 4 Q.H.  
Convex sets in Euclidean  $n$ -space, linear and nonlinear programming, zero-sum games, dynamic programming. Students are encouraged to program selected solution methods for a computer.

**10.264 Recent Ideas in Geometry** (Prereq. 10.251 and 10.247 or consent of instructor) 4 Q.H.  
Topics chosen by the instructor may vary each year. Topological classification of surfaces, theory of critical points and singularities of mappings, topological study of vector fields, knot theory, graph theory, differential geometry of surfaces, algebraic curves, homotopy.

**10.265 Recent Ideas in Geometry** (Prereq. 10.264) 4 Q.H.  
Continuation of 10.264.

**10.271 Foundations of Mathematics** (Prereq. 10.250 or equiv.) 4 Q.H.  
Logic and set theory.  
To be offered alternate years.

**10.272 Foundations of Mathematics** (Prereq. 10.271) 4 Q.H.  
Continuation of 10.271.  
To be offered alternate years.

**10.273 History of Mathematics** 4 Q.H.  
Development of the various branches of mathematics; lives of outstanding mathematicians; growth of mathematical knowledge and its relation to culture.

**10.274 Number Theory** (Prereq. 10.246 or consent of instructor) 4 Q.H.  
Properties of integers, divisibility, congruences, and topics chosen from: magic squares, diophantine equations, continued fractions, or quadratic fields. No specific subject matter is a prerequisite, but to have sufficient "mathematical maturity," it is recommended that the student complete the sequence 10.181-10.187 and 10.246 before taking this course.

**10.281-10.289 Directed Study** (Prereq. Consent of Instructor) 4 Q.H.  
Programs of directed study, held one or more quarters, are available for highly motivated students who wish to explore mathematical situations and theories in depth. Directed study

can be used as an opportunity to examine familiar material in fresh ways or to explore new material that is not offered in formal courses. It is hoped that directed study programs will allow strong students in mathematics and the related sciences a chance to develop the art and skill needed to work independently and creatively in mathematics.

*Note: Strong students are also permitted to enroll in Graduate courses in Mathematics.*

**10.295, 10.296, 10.297, 10.298 Honors Program** (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

**10.307 College Algebra and Trigonometry I**

(Prereq. Math Placement Test or 10.302) 4 Q.H.

Fundamental operations of algebra, algebraic fractions, exponents and radicals, functions. Trigonometric functions of angles both in degree and in radian measure; right triangles; identities and equations.

**10.308 College Algebra and Trigonometry II** (Prereq. 10.307) 4 Q.H.

Quadratic equations and applications, radical equations, complex numbers, binomial expansion, variation, roots of polynomial equations. Trigonometric graphs, other transcendental functions, logarithms, inverse trigonometric functions.

**10.320 Calculus** (Prereq. 10.308,) 4 Q.H.

Functions, graphs, and limits; study of the straight line, the circle, the parabola; differentiation of algebraic functions, with applications, including curve-sketching.

**10.421 Calculus A** (Prereq. 10.320) 4 Q.H.

Applications of derivatives to curve-sketching, anti-differentiation, the definite integral with applications, calculus of non-algebraic functions—logarithmic, exponential, and trigonometric. Calculus of inverse trigonometric functions, techniques of integration, polar coordinates, the conic sections, vectors in a plane, indeterminate forms, L'Hôpital's rule.

**10.422 Calculus B** (Prereq. 10.421) 4 Q.H.

Calculus of functions of several variables, partial differentiation, multiple integrals, infinite series. Vector analysis; matrices and linear algebra.

**10.423 Differential Equations** (Prereq. 10.422) 4 Q.H.

Ordinary differential equations—standard types of the first order; linear differential equations, especially with constant coefficients; Laplace transforms; series solutions of differential equations. Fourier series and orthogonal functions.

## Physics

Courses are listed according to level and degree of specialization, and are not in numerical order. General Interest Courses have no prerequisite and may be used to satisfy College of Liberal Arts distribution requirements in science. Introductory Physics Courses are basic first-year physics lecture courses; the corresponding laboratories are listed under Introductory Physics Laboratories. Advanced Physics and Astronomy courses require one year of introductory physics and may be used to satisfy degree requirements for physics majors. Courses marked with a dagger (†) are offered for students in the full-time day program in Lincoln College; they do not fulfill credit requirements in the College of Liberal Arts.

### GENERAL INTEREST COURSES

**11.108 Physics In Sports** 4 Q.H.

Covers some of the physical principles involved in sports. Topics include: sailing, skiing, baseball, tennis, gymnastics, and caloric considerations.

**11.109 Physics In Music** 4 Q.H.

Discusses the physical principles involved in the production, recording and reproduction of music. Topics include: explanations of how various instruments work in terms of the basic

properties of resonances and waves; physical and psychological response of the ear; the physical basis of the modern (well-tempered) system of tuning; how microphones, amplifiers, loudspeakers, tape recorders, radios, and other devices work.

**11.139 Physics and Established Thought**

4 Q.H.

The major effects of physics on Western culture. Concepts are covered in breadth rather than in depth. Some of the major historical conflicts in Western culture are discussed and the role of physics in these conflicts developed. Students should gain a broad knowledge of the scientific method and an understanding of the conflicts between science and society from the course. Topics covered include: Cosmology and Anthropology, Causality and Free Will, Physics Evolution and ESP, and Physics and Intuition.

**11.141 Energy and Society I**

4 Q.H.

Historical development of the concept of energy. Uses of energy in primitive, developing and technological societies. The physical nature of energy. Conservation, transmission and storage of energy. Power plants and energy resources. The problems of growth, depletion, and planning.

**11.142 Energy and Society II**

(Prereq. 11.141) 4 Q.H.

Chemical and nuclear energy sources. Generation of electrical energy. Alternative sources of energy: coal, solar, geothermal, tidal, fusion. Alternative in the use of energy: conservation and improved efficiency. Environmental and societal impact of energy.

**11.180 Introduction to Astronomy I**

4 Q.H.

The first quarter of a two-quarter course. The purpose of the course is to introduce the non-science student to modern astronomical ideas, many of which have been developed over the past decade. No mathematics or science prerequisites are assumed. Mathematical discussions are kept to a minimum and use only arithmetic and elementary geometry. The lectures will be coordinated with several evening viewing sessions through the Department's 8" reflecting telescope. The following topics will be covered: the earth in space (motion of the earth, solar and lunar eclipses); tools of the astronomer (the nature of light, telescopes, radio telescopes); solar system (the planets; knowledge gained from Mariner flights; asteroids, comets and meteors; origin of solar system, origin of life), the sun; properties of stars; stellar sizes; multiple stars; variable stars; life and death of stars (nuclear reactions and energy sources; birth of stars; main-sequence stars; red giants; white dwarfs; supernovas; neutron stars and pulsars; black holes); galaxies (the Milky Way; size of galaxy; types of galaxies; evolution of galaxies; galactic distances; quasars); cosmology (the expanding universe; the big bang theory; the universe in the distant future).

**11.181 Introduction to Astronomy II**

(Prereq. 11.180) 4 Q.H.

Continuation of 11.180.

**INTRODUCTORY PHYSICS COURSES**

**11.112 Physics of Fluids**

3 Q.H.

The physical properties of gases and liquids, with emphasis on their application to the health services. Force and pressure, hydrostatics, fluid flow, the ideal gas laws, real gases, condensation and evaporation, surface tension and osmosis. An introduction to electricity is given if time permits.

**11.113 Physics for Criminal Justice Students I**

4 Q.H.

The first quarter of a two-quarter course intended to serve both as a basis for advanced study of criminalistics and an introduction to the physical sciences for students specializing in other areas of criminal justice. A broad range of topics is covered, from ballistics to atomic and molecular structure. Emphasis is placed on physical fundamentals rather than on mathematical rigor. Examples taken from case histories are used to illustrate the application of basic physical laws in realistic crime-lab and courtroom situations. These include: calculation of bullet and blood-spatter trajectories, possible and impossible traffic violations, the cooling curve of cadavers and its relation to the time of death, the human vocal frequency spectrum and the use of "voice-prints," the optical spectrum and spectroscopic identification

of materials. Doppler shift and radar speed measurements, and the relation of microscopic structure to the fracture and deformation properties of solids.

**11.114 Physics for Criminal Justice Students II** (Prereq. 11.113) 4 Q.H.  
Continuation of 11.113.

**11.117 Physics for Science Majors I** (Prereq. A beginning calculus course concurrently) 4 Q.H.  
Mechanics: kinematics, Newton's Laws, circular motion, work energy, harmonic motion, relativity.

**11.118 Physics for Science Majors II** (Prereq. 11.117) 4 Q.H.  
Momentum and angular momentum, fluids, gases, thermodynamics, waves, geometrical and physical optics.

**11.119 Physics for Science Majors III** (Prereq. 11.117) 4 Q.H.  
Electricity and magnetism, quanta, Bohr atom, and nuclear physics.

**11.126 Physics Review** (Prereq. One year of physics) 4 Q.H.\*  
A special review course on the material of 11.203, 11.204, 11.205, and 11.206. The course is geared to the student's needs. Passing is equivalent to passing 11.206.

**11.171 Physics for the Life Sciences I** 4 Q.H.  
Vector addition of force, principles of statics, Newton's second law, kinetic and potential energy, pressure, static properties of fluids, fluid flow.

**11.172 Physics for the Life Sciences II** (Prereq. 11.171) 4 Q.H.  
Wave motion, sound, light, optics, static electricity, DC circuits, magnetism.

**11.175 Physics for the Life Sciences III** (Prereq. 11.171) 4 Q.H.  
Temperature, gas laws, properties of liquids (surface tension and osmotic pressure), properties of solids, thermal physics, Coulomb's law, atomic and nuclear physics.

**11.176 Physics for Psychology I** 4 Q.H.  
A two-quarter sequence intended primarily for psychology majors. The geometrical nature of physical laws; probability and statistics in physics; mechanics, kinematics, and energy. Light; sound; electricity and magnetism. Topics in modern physics such as atomic and nuclear structure, cosmology.

**11.177 Physics for Psychology II** (No prereq.) 4 Q.H.  
Continuation of 11.176.

**11.203 Physics for Engineering Students I** 4 Q.H.  
The first quarter of a four-quarter sequence intended primarily for engineering students. The student is assumed to be taking a four-quarter calculus sequence concurrently. The aim of the course is to give the student a working knowledge of physics. The first quarter deals with vector algebra and the dynamics of particle motion.

**11.204 Physics for Engineering Students II** (Prereq. 11.203) 4 Q.H.  
Continuation of 11.203. Conservation laws and their use in solving problems in elementary dynamics. Wave motion and vibrating systems.

**11.205 Physics for Engineering Students III** (Prereq. 11.204) 4 Q.H.  
Continuation of 11.204. Electricity and magnetism.

**11.206 Physics for Engineering Students IV** (Prereq. 11.205) 4 Q.H.  
Continuation of 11.205. Circuit theory, electromagnetic waves, light.

**11.317† Physics I** (Prereq. 10.307 or concurrently) 4 Q.H.  
Kinematics and dynamics of particle motion, Newton's laws, projectile and circular motion, conservation laws for momentum and energy, rotational motion, simple harmonic motion.

**11.318† Physics II** (Prereq. 11.317) 4 Q.H.  
Wave motion, intensity, interference phenomena, Doppler effect, vibrating systems, temperature, heat, change of state, heat transfer, kinetic theory of gases, general gas laws, thermodynamics.



**11.319† Physics III** (Prereq. 11.318) 4 Q.H.  
Electrostatics, magnetism, magnetic induction, induced currents, direct and alternating current circuits, properties of light, reflection, refraction, dispersion, optical systems, diffraction, polarization.

**11.420† Physics IV** (Prereq. 11.319) 4 Q.H.  
Static electric and magnetic fields. Experimental basis for Maxwell's equations. Electromagnetic waves.

## INTRODUCTORY PHYSICS LABORATORIES

**11.110 Physics Laboratory for Engineering Students I** (Prereq. 11.205) 1 Q.H.  
The first quarter of a two-quarter laboratory sequence in which the student performs experiments from various fields of physics.

**11.111 Physics Laboratory for Engineering Students II** (Prereq. 11.110) 1 Q.H.  
Continuation of 11.110.

**11.147 Physics Laboratory for Science Majors I** 1 Q.H.  
First quarter of a three-quarter laboratory sequence with experiments related to topics covered in 11.117.

**11.148 Physics Laboratory for Science Majors II** 1 Q.H.  
A continuation of 11.147. Experiments correspond to topics covered in 11.118.

**11.149 Physics Laboratory for Science Majors III** 1 Q.H.  
A continuation of 11.148. Experiments correspond to topics covered in 11.119.

**11.173 Physics Laboratory for the Life Sciences I**  
(Prereq. 11.117 or 11.171 concurrently) 1 Q.H.

The first quarter of a two-quarter laboratory sequence that accompanies 11.171 and 11.172. The student performs experiments from various fields of physics.

**11.174 Physics Laboratory for the Life Sciences II** (Prereq. 11.173) 1 Q.H.  
Continuation of 11.173.

**11.178 Physics Laboratory for Psychology Students I**  
(Prereq. 11.176 concurrently) 1 Q.H.

The first quarter of a two-quarter laboratory sequence that accompanies 11.176 and 11.177. The students perform experiments in various fields of physics, some involving use of the university computer.

**11.179 Physics Laboratory for Psychology Students II**  
(Prereq. 11.177 concurrently) 1 Q.H.  
Continuation of 11.178.

**11.373† Physics Laboratory I** 2 Q.H.  
Experiments from various physics topics that have been covered in 11.317 and concurrently in 11.318.

**11.374† Physics Laboratory II** (Prereq. 11.373) 2 Q.H.  
A continuation of 11.373, with experiments from topics in 11.318 and 11.319.

## ADVANCED PHYSICS AND ASTRONOMY COURSES

**11.127 Intermediate Mechanics**  
(Prereq. changed to [11.118 or 11.205] and [10.184 concurrently]) 4 Q.H.  
Classical mechanics in two and three dimensions; a review of Newton's laws. Special emphasis on conservation theorems for energy, momentum and angular momentum. Harmonic and wave motion.

**11.128 Electric and Magnetic Fields**  
(Prereq. [11.119 or 11.205] and [10.185 concurrently]) 4 Q.H.  
The basic concepts of electric and magnetic fields. Covers electric and magnetic fields in free

space and in materials and Maxwell's equations in integral form.

**11.182 Astrophysics and Cosmology I** (Prereq. 11.128 or 11.206) 4 Q.H.

The first quarter of a two-quarter course. The purpose of the course is to introduce the student who has had two quarters of elementary physics to present ideas in astrophysics and cosmology. Emphasis is placed on surveying recent advances in this field. The mathematics used is mainly geometry, trigonometry and algebra. Topics to be covered include: tools of the astronomer (telescopes, radio telescopes, spectroscopes); stellar properties (distances, stellar radii, magnitude and luminosity); stellar spectra; Hertzsprung-Russell diagram; stellar energy sources (gravitational energy, stellar nuclear reactions); evolution of stars (birth, main sequence, red giants, white dwarfs, supernovas, neutron stars and pulsars, black holes and gravitational collapse); Milky Way (galactic rotation, galactic nucleus; cosmic rays); extragalactic objects (masses of galaxies, clusters of galaxies, galactic distances, radio galaxies, Quasars); cosmology (Olber's paradox; recession of galaxies; big bang theory  $3^\circ\text{K}$  radiation; formation of galaxies; the universe in the distant future.)

**11.200 Classical Mechanics** (Prereq. 11.127 and 10.186) 4 Q.H.

Advanced topics in classical mechanics. Vector kinematics, harmonic oscillator and resonance, generalized coordinates, Lagrange's equations, central forces and the Kepler problem and rigid body motion.

**11.208 Mathematical Physics**

(Prereq. 11.119 and 10.185 and [10.187 concurrently]) 4 Q.H.

Review of linear algebra and vector calculus. Special functions and partial differential equations of physics. Potential theory. Functions of a complex variable.

**11.21A (B, C, etc.) Independent Study** 1 Q.H.

**11.22A (B, C, etc.) Independent Study** 2 Q.H.

**11.23A (B, C, etc.) Independent Study** 3 Q.H.

**11.24A (B, C, etc.) Independent Study** 4 Q.H.

**11.211 Electricity and Magnetism I** (Prereq. 11.128 and [11.208 or equiv.]) 4 Q.H.

The first quarter of a two-quarter sequence in electromagnetic theory. Maxwell's equations and their experimental basis; electrostatics and magnetostatics; the electromagnetic field in empty space; electromagnetic waves.

**11.212 Electricity and Magnetism II** (Prereq. 11.211) 4 Q.H.

Continuation of 11.211. Energy and momentum in the electromagnetic field. Electrodynamics; the interaction of matter and the field. Radiation.

**11.220 Thermodynamics and Kinetic Theory**

(Prereq. [11.119 or 11.206] and 10.184) 4 Q.H.

First and second laws of thermodynamics. Entropy and equilibrium. Thermodynamic potentials. Elementary kinetic theory. Statistical mechanics and the statistical interpretation of entropy.

**11.221 Wave Motion and Optics** (Prereq. 11.128) 4 Q.H.

Harmonic and coupled oscillators, wave equation. Geometrical and physical optics; interference, diffraction, optics of solids, amplification of light; lasers.

**11.230 Modern Physics** (Prereq. 11.128 or 11.206 or equiv.) 4 Q.H.

A review of experiments demonstrating the atomic nature of matter, the properties of the electron, the nuclear atom, the wave-particle duality, spin, and the properties of elementary particles. The course discusses, mostly on a phenomenological level, such subjects as atomic and nuclear structure, properties of the solid state, and elementary particles.

**11.240 Quantum Mechanics I** (Prereq. [11.230 or 12.170] and [11.208 or equiv.]) 4 Q.H.

The first of a two-quarter sequence in quantum mechanics. Observations of macroscopic and microscopic bodies. The uncertainty principle, wave particle duality, probability amplitudes, Schrodinger wave theory, and one-dimensional problems.

**11.241 Quantum Mechanics II** (Prereq. 11.240) 4 Q.H.

Continuation of 11.240. Discrete and continuous states, Schrodinger equation in three

dimensions, angular momentum, general theory of quantum mechanics, applications.

**11.246 Electronics and Data Analysis I** (Prereq. 11.119 or 11.205) 4 Q.H.\*

A two-quarter course intended to teach those electronic and data-analysis techniques that are common to research in all fields of experimental physics. Subjects in electronics will be: principles of semiconductor devices; analog techniques including feedback and servo loops, and wideband amplification; digital techniques including integrated circuits and logic techniques; design of electronic subsystems such as counters, analog-to-digital converters and phase-sensitive detectors. Subjects in data analysis will be probability theory; distribution functions; fitting data with a hypothesis; error estimation. Time permitting, high-vacuum techniques, cryogenic techniques, and lasers may also be covered.

**11.247 Electronics and Data Analysis II** (Prereq. 11.246) 4 Q.H.\*

Continuation of 11.246.

**11.260 Wave Laboratory** (Prereq. 11.128 or 11.206) 4 Q.H.

A general treatment of the problems of mechanical and electromagnetic radiation as wave phenomena. The differential wave equation and its application to selected topics. Interference and diffraction theory from the standpoint of the Huygens-Fresnel and Kirchhoff formulations. Selected experiments in acoustics, optics, and microwaves to illustrate these problems.

**11.272 Modern Physics Laboratory** (Prereq. 11.230 or instructor's permission) 4 Q.H.

Experiments investigating the atomic nature of matter, the properties of the electron, and special relativity. The work involves vacuum system techniques and machine-shop practice.

**11.273 Advanced Physics Laboratory** (Prereq. 11.246 and 11.260) 4 Q.H.

Special projects in modern experimental physics.

**11.281 Properties of Matter** (Prereq. 10.205, 11.128 or 11.206) 4 Q.H.

The quantitative description of solids, liquids, and gases. Topics include: the kinetic theory of gases (distribution functions, collisions, viscosity, thermal conductivity, diffusion), gas imperfection, real gases, the transition to the liquid phase, amorphous and crystalline solid structure, alloys and the metallurgical phase diagram, imperfections in solids.

**11.282 Introduction to Solid State Physics**

(Prereq. [11.230 or 12.170] and [11.220 or equiv.]) 4 Q.H.

A semi-classical treatment of the thermal, magnetic, and electrical properties of crystalline solids. Topics include: x-ray diffraction and the reciprocal lattice, elasticity and lattice vibrations, specific heat, properties of insulators, magnetism in insulators and in metals, introduction to the band theory of metals.

**11.285 Introduction to Nuclear Physics** (Prereq. 11.230) 4 Q.H.

Nuclear structure, nuclear masses, radioactivity, nuclear radiation, interaction of radiation and matter, detectors, fission, nuclear forces, elementary particles.

**11.295, 11.296, 11.297, 11.298 Junior-Senior Honors Program** (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Chemistry

**12.101 General Chemistry** 3 Q.H.\*

Inorganic and organic chemistry principles and their application to the health sciences.

**12.102 General Chemistry** (Prereq. 12.101) 3 Q.H.\*

Biochemistry principles and their application to the health sciences.

**12.103 General Chemistry** 5 Q.H.\*

For Chemistry majors and selected students in other majors, such as Biology, Physics, etc. Basic concepts and definitions, moles, gas laws, electrolysis, ions, stoichiometry, chemical equilibrium, periodicity of elements, oxidation-reduction.

\*Including lab.

**12.104 General Chemistry**

(Prereq. 12.103) 5 Q.H.\*

Atomic structure, chemical bonding, introduction to chemical thermodynamics, electrochemistry, chemical kinetics.

**12.105 Analytical Chemistry**

(Prereq. 12.104) 5 Q.H.\*

Theory, apparatus, operations, and interpretation of observations for a broad spectrum of present-day methods of chemical analysis, including electrical, optical, gravimetric, and titrimetric techniques.

**12.106 General Chemistry**

5 Q.H.\*

For non-Chemistry majors. Basic concepts and definitions, the mole concept and chemical stoichiometry, states of matter, solutions, periodicity of elements, atomic structure, chemical bonding and reactions.

**12.107 General Chemistry**

(Prereq. 12.106) 5 Q.H.\*

For non-Chemistry majors. Chemical kinetics and equilibria, acids and bases, elementary thermodynamics, electrolysis and electrochemistry, chemistry of representative elements, nuclear chemistry, introduction to organic chemistry.

**12.108 Fundamentals of Chemical Sciences I**

4 Q.H.

Development and discussion of important principles and concepts of the chemical sciences. Intended for students in the social sciences and humanities with minimal background in science and mathematics. The objective of 12.108-109 is to give the non-science student an appreciation and some knowledge of the role of chemistry in our technological society and in our everyday lives.

**12.109 Fundamentals of Chemical Sciences II**

(Prereq. 12.108) 4 Q.H.

Continuation of 12.108. Discussion of the chemistry involved in such basic human needs as food, clothing, shelter, transportation, and energy production. Other topics (e.g., environmental problems) may be included or substituted, since students will participate in selection of topics for discussion.

**12.110 The Chemical Elements**

(Prereq. 12.104 or 12.107) 5 Q.H.\*

For Chemistry majors and selected students in other majors, such as Biology, Physics, etc. The principal concepts of chemistry (thermodynamics, chemical bonding, and chemical kinetics) are applied to a systematic survey of the characteristic behavior of the chemical elements and their compounds.

**12.114 General Chemistry**

4 Q.H.

Primarily for engineering students. Introduction to the principles of chemistry, focusing upon the states and structure of matter and chemical stoichiometry.

**12.115 General Chemistry**

(Prereq. 12.114) 4 Q.H.

Primarily for engineering students. Introduction to the principles of chemistry, focusing upon chemical equilibria and the nature of some common materials.

**12.118 General Chemistry Laboratory**

1 Q.H.

Optional laboratory for 12.115 (General Chemistry for engineering students). Experiments pertaining to lecture material.

**12.139 General Chemistry**

4 Q.H.\*

For students in the College of Criminal Justice. Structure of matter; physical and chemical properties of metallic and nonmetallic elements, inorganic compounds, and alloys; stoichiometry; solids, liquids, and solutions. Laboratory experiments illustrate basic chemical principles and representative chemical reactions.

**12.140 General Chemistry**

(Prereq. 12.139) 4 Q.H.\*

For students in the College of Criminal Justice. Continuation of 12.139, with emphasis on application of principles. Chemical reactivity, acids and bases, oxidation-reduction, physical and chemical properties of organic compounds. Laboratory continues studies of the first quarter.

- 12.144 Organic Chemistry** (Prereq. 12.104 or 12.107) 5 Q.H.\*  
Nomenclature, preparation, properties, and reactions of common organic compounds.
- 12.145 Organic Chemistry** (Prereq. 12.144) 5 Q.H.\*  
Continuation of 12.144.
- 12.147 Organic Chemistry** (Prereq. 12.115) 4 Q.H.\*  
Aliphatic compounds; preparation, properties, and reactions of the more common classes of open-chain compounds; electronic interpretation of structures and reactions; petrochemicals; synthetic resins; carbohydrates; fats; proteins.
- 12.148 Organic Chemistry** (Prereq. 12.147) 4 Q.H.\*  
Aromatic compounds; preparation, properties, and reactions of the more common classes of aromatic compounds; electronic interpretation of structures and reactions of aromatic compounds; dyes, commercial solvents, and important industrial products. A brief introduction to alicyclic and heterocyclic compounds.
- 12.153 Organic Chemistry** (Prereq. 12.110) 3 Q.H.  
Syntheses and properties of aliphatic and aromatic hydrocarbons and their functional derivatives; correlation between the structure of organic compounds and their physical and chemical properties; electronic interpretation of organic reactions.
- 12.154 Organic Chemistry** (Prereq. 12.153) 5 Q.H.\*  
Continuation of 12.153.
- 12.155 Organic Chemistry** (Prereq. 12.154) 5 Q.H.\*  
Continuation of 12.154.
- 12.161 Physical Chemistry** (Prereq. 10.152 and 11.118 or equiv.) 4 Q.H.\*  
Chemical thermodynamics.
- 12.162 Physical Chemistry** (Prereq. 12.161) 4 Q.H.\*  
Phase equilibria, solutions, kinetic theory of gases, chemical kinetics.
- 12.166 Physical Chemistry** (Prereq. 10.152 and 11.118 or equiv.) 3 Q.H.  
Similar to 12.161, but without laboratory.
- 12.168 Physical Chemistry** (Prereq. 12.162 or 12.169) 4 Q.H.\*  
Quantum chemistry, particles and waves, Schrodinger wave mechanics, the chemical bond.
- 12.169 Physical Chemistry** (Prereq. 12.161 or 12.166) 3 Q.H.  
Similar to 12.162, but without laboratory.
- 12.170 Physical Chemistry** (Prereq. 12.162 or 12.169) 3 Q.H.  
Similar to 12.168, but without laboratory.
- 12.171 Analytical Chemistry** (Prereq. 12.107 or equiv.) 4 Q.H.\*  
Theories, principles, and application of volumetric, gravimetric, and instrumental methods of analysis.
- 12.179 Instrumental Analysis** (Prereq. 12.105 or 12.171) 5 Q.H.\*  
Theory, procedures, operations, and apparatus used in instrumental analysis, with emphasis on interpretation of results from typical scientific investigations. Current practices in the following methods are included: atomic absorption, ultraviolet and infrared absorption, voltammetry, anodic stripping, coulometry, gas chromatography, high-speed liquid chromatography, radio-tracer techniques, and neutron activation analysis.
- 12.180 Ocean Chemistry** (Prereq. 12.105, 12.171, or equiv.) 4 Q.H.\*  
Principles and practices of chemical and instrumental methods in current use in marine investigations, with emphasis on procedures, apparatus, and interpretation of experimental observations. Laboratory exercises include: chlorinity and salinity measurements, biological oxygen demand, trace nutrient measurement, carbonate alkalinity, heavy metal pollutants, and selected projects.
- 12.181 Instrumental Analysis** (Prereq. 12.105 or 12.171) 3 Q.H.  
Similar to 12.179, but without laboratory.

**12.183 Principles of Experimental Chemistry**

(Prereq. 10.183 and 11.118 or equiv.) 4 Q.H.\*

Design of experimentation, data acquisition, data recording, treatment of data. The accompanying laboratory considers measurement, processing, and recording of electrical signals and optical experiments pertinent to chemical instrumentation.

**12.185 Inorganic Chemistry**

(Prereq. 12.105) 2 Q.H.

Atomic properties of free atoms and ions. Ionic bonding and the structure of the solid state. The Madelung calculation; the Born-Haber and other thermodynamic cycles. Valence-bond and molecular orbital theories of bonding. Stereochemistry of compounds of representative elements. Electron-deficient compounds.

**12.213 Inorganic Chemistry**

(Prereq. 12.168) 4 Q.H.

Atomic properties of free atoms and ions. Ionic bonding and the structure of the solid state. The Madelung calculation; the Born-Haber and other thermodynamic cycles. Valence bond, molecular orbital, and crystal field theories of bonding. Stereochemistry of compounds of representative elements. Electron deficient compounds. Spectral and magnetic properties of transition metal compounds.

**12.252 Advanced Organic Chemistry I**

(Prereq. 12.155 or 12.145) 3 Q.H.

Organic structure and reactions. Corresponds to graduate course 12.861.

**12.253 Identification of Organic Compounds**

(Prereq. 12.155) 3 Q.H.\*

Qualitative analysis of organic compounds and mixtures, using physical, chemical and instrumental methods.

**12.254 Advanced Organic Chemistry II**

(Prereq. 12.252) 3 Q.H.

Organic structure and reactions. Corresponds to graduate course 12.862.

**12.255 Advanced Organic Chemistry III**

(Prereq. 12.254) 3 Q.H.

Organic structure and properties. Corresponds to graduate course 12.863.

**12.257 Advanced Analytical Chemistry I**

(Prereq. 12.179) 3 Q.H.

Analytical separations. Corresponds to graduate course 12.821.

**12.258 Advanced Analytical Chemistry II**

(Prereq. 12.179) 3 Q.H.

Electronanalytical. Corresponds to graduate course 12.822.

**12.259 Advanced Analytical Chemistry III**

(Prereq. 12.179) 3 Q.H.

Optical methods of analysis. Corresponds to graduate course 12.823.

**12.262 Advanced Physical Chemistry I**

(Prereq. 12.168) 3 Q.H.

Chemical thermodynamics. Corresponds to graduate course 12.881.

**12.263 Advanced Physical Chemistry II**

(Prereq. 12.168) 3 Q.H.

Atomic and molecular structure. Corresponds to graduate course 12.885.

**12.264 Advanced Physical Chemistry III**

(Prereq. 12.168) 3 Q.H.

Chemical kinetics. Corresponds to graduate course 12.893.

**12.266 Advanced Inorganic Chemistry I**

(Prereq. 12.213) 3 Q.H.

Application of quantum chemistry to inorganic systems. Corresponds to graduate course 12.841.

**12.267 Advanced Inorganic Chemistry II**

(Prereq. 12.266) 3 Q.H.

Continuation of 12.266. Corresponds to graduate course 12.842.

**12.268 Advanced Inorganic Chemistry III**

(Prereq. 12.267) 3 Q.H.

Chemistry of the solid state. Corresponds to graduate course 12.843.

**12.271, 12.272, 12.273,**

(each) 3 Q.H.

**12.274, 12.275, 12.276 Undergraduate Research**

(each) 4 Q.H.

Original experimental work under the direction of a staff member. Participation may begin in the middle year and will normally continue through the senior year. Approval of the administering committee is required.

**12.284 Advanced Chemical Synthesis**

(Prereq. 12.155) 3 Q.H.\*

Special projects in the synthesis of organic and/or inorganic compounds, using advanced techniques.

**12.286 Advanced Chemical Measurements**

(Prereq. 12.168 and 12.179) 3 Q.H.\*

Laboratory problems in analytical and/or physical chemistry.

**12.288 Special Topics**

(Prereq. 12.168) 4 Q.H.

**12.295, 12.196, 12.297, 12.298 Junior-Senior Honors Program**

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Earth Sciences

**16.109 Environmental Geosciences I**

4 Q.H.

Emphasis placed on applying man's understanding of relevant earth processes to both making decisions and evaluating the decisions made by others (i.e., neighbors, industry, and governments). Topics include: earthquakes—control and prediction; the earth as a source of energy and other materials; groundwater—needs and pollution; disposal of wastes in the earth.

**16.110 Environmental Geosciences II**

4 Q.H.

An approach similar to Environmental Geosciences I but with an emphasis on atmospheric components and systems interacting with man. Specifically treated are such problems as population growth and compaction as well as weather control, climatic modification, and pollution hazards.

**16.130 Marine Resources**

4 Q.H.

A qualitative and quantitative survey of renewable and non-renewable resources from the sea. Aspects covered include: offshore oil and gas utilization, marine minerals, and tidal power; coastal zone recreational resources, including aspects of polluted beaches and artificial fishing reefs.

**16.131 Oceanography I**

4 Q.H.\*

The geology of the ocean basins; the physical and chemical properties of sea water; the development of ocean currents and their important effects on the land masses of the world.

**16.132 Oceanography II**

4 Q.H.\*

The productivity of animal and plant life in the various zones of the ocean; the growing economic importance of the oceans as a source of food for the expanding world population.

**16.140 Astrogeology**

4 Q.H.

An examination of the geologic features of the moon and the planets, in the light of recent space explorations and current geologic theory. Evaluation of their evolution from a geologic perspective.

**16.161 Observational Astronomy**

4 Q.H.

Introduction to the night sky by confrontation technique. Identification of the permanency of the circumpolar region. A systematic analysis of the available hour-angle constellations. Relevant supportive data provided for each nightly viewing. Continuous records of the characteristic behavior of the sun, moon and available naked-eye planets. Periodic out-of-doors viewing sessions with binoculars and telescopes (amateur quality) especially on occasions of special phenomena, i.e., meteor showers and comets. Explanatory instructional information during open portions of class periods by lecture, lecture-demonstration, or planetary sessions.

**16.165 Principles of Planetary Science**

4 Q.H.

Ancient concepts of the "Universe" derived from naked-eye observations; the evolutionary development of the Ptolemaic Universe and its final defeat by developments ranging from Copernicus to Newton. Detailed studies of the characteristic physical-chemical features and

\*Including lab.

behaviors of the individual components of the Solar System. Non-Copernican phenomena: meteors, meteor showers, aurora, etc.; the recent contributions of the NASA programs to our understanding of our earth.

**16.180 Physical Geography I**

4 Q.H.

Constructed to promote an understanding of man's physical environment, with concentration of study upon weather, climate, and vegetation on a world-wide scale.

**16.182 Physical Geography II**

(Prereq. 16.180) 4 Q.H.

An interpretative description and analysis of landforms and soils. Emphasis on an examination of landform development and distribution.

**16.186 Applied Climatology**

(Prereq. 16.180) 4 Q.H.

The individual elements of climate are synthesized into climatic types and regions. Climatic classifications are employed as vehicles for describing the distribution of climates. Microclimatology and applied climatology and human dimensions of weather modification are introduced.

**16.187 Urban Geography**

4 Q.H.

Geographic structures and functions of individual cities are elaborated and the factors which determine those structures studied. Theory of city systems is developed in detail and the modern megalopolitan forms explained. Processes and problems of city growth are investigated and an attempt made to consolidate the variety of explanations for them.

**16.188 Economic Geography**

4 Q.H.

The underlying principles governing the spatial distribution of economic activities. The principles of comparative advantage, transportation costs, scale and agglomeration economics as well as current location theories will be discussed.

**16.191 Meteorology**

4 Q.H.

Physical factors and processes in the atmosphere which cause weather. Examples used to illustrate general concepts will be drawn from the New England region.

**16.200 Geology of New England**

4 Q.H.

Geological development of the Appalachian mountains in New England. First half of course on bedrock geology; second half on evolution of the surface features chiefly by glacier action during the recent ice age.

**16.201 Physical Geology**

4 Q.H.

A systematic study of the materials comprising the earth. Topics emphasized include the processes by which rock is formed, transported, altered, and destroyed, as well as the nature and development of landscape.

**16.202 Historical Geology**

4 Q.H.

The physical and biological history of the earth is traced through geologic time. Major topics are the origin and evolution of life, mountain building, and continental drift.

**16.203 Physical Geology Laboratory**

(Prereq. 16.201 or concurrently) 1 Q.H.\*

Optional laboratory for Physical Geology 16.201. Laboratory exercises pertain to mineral and rock identification and topographic and geologic map interpretation. Required for Geology majors.

**16.204 Historical Geology Laboratory**

(Prereq. 16.202 or concurrently) 1 Q.H.\*

Fossil representatives of major invertebrate phyla; application of fossils to studies of rock sequences; and interpretation of geologic history from geologic maps.

**16.205 Regional Geology of North America**

(Prereq. 16.201, 16.202) 4 Q.H.

The evolution of the North American continent through geologic time. Emphasis is placed on selected regions which illustrate principles of continental evolution or significant stages in that evolution. Included among the selected regions are the Canadian Shield, the Interior Lowlands, the Appalachian Mountains and related systems, and the mountain belts of western North America.



- 16.206 Rock Identification Laboratory** (Prereq. 16.211 or concurrently) 1 Q.H.  
Self-paced laboratory exercises in the identification and classification of common rocks.
- 16.211 Descriptive Mineralogy** (Prereq. One year of chemistry) 4 Q.H.\*  
Study of mineralogy, including crystallography, and physical, chemical, and descriptive mineralogy of the common rock-forming minerals.
- 16.212 Optical Crystallography** (Prereq. 16.211) 4 Q.H.\*  
Both the theory and the practical methods of optical crystallography are studied, including the basic techniques for determining the optical constants of crystals using the polarizing microscope and immersion media.
- 16.213 Optical Mineralogy** (Prereq. 16.212) 4 Q.H.\*  
The identification of the common rock-forming minerals using the petrographic microscope and rock-thin sections, including an introduction to mineral phase relationships.
- 16.214 Geochemistry** (Prereq. One year of chemistry) 4 Q.H.  
An evaluation of chemical processes important in the various geologic environments; and their effects on the development of the lithosphere.
- 16.216 Igneous and Metamorphic Petrology** (Prereq. 16.213) 4 Q.H.\*  
The evolution of crystalline rocks and their distribution in time and space, including the physical and chemical factors in igneous and metamorphic processes.
- 16.221 Stratigraphy and Sedimentation** (Prereq. 16.202) 4 Q.H.\*  
The lithologic properties and stratigraphic relationships of sedimentary rock. Sedimentary processes, facies, and provinces of deposition are considered in conjunction with the collecting and evaluating of stratigraphic data. Classic stratigraphic sequences are reviewed, with emphasis on the general stratigraphic principles which they illustrate.
- 16.222 Sedimentary Petrology** (Prereq. 16.212) 4 Q.H.\*  
The origin, classification, petrography, and environment of deposition of all important types of sedimentary rocks. Laboratory work is concerned with the study and interpretation of sedimentary rocks in thin section.
- 16.231 Glacial and Pleistocene Geology** (Prereq. 16.202) 4 Q.H.  
The processes of ice movement and the characteristics and distribution of erosional and depositional structures which are associated with past and present glaciers. Introduction to Pleistocene chronology and correlations.
- 16.232 Geomorphology** (Prereq. 16.201) 4 Q.H.  
The origin and evolution of landscape features by processes operating at or near the earth's surface.
- 16.233 Coastal Processes** (Prereq. 16.201) 4 Q.H.  
The effect of nearshore marine processes and the resultant coastal responses. The dynamics of waves and currents and the associated erosion, transportation, and deposition of sediment forming beaches, barrier islands, and cliffed structures.
- 16.234 Fluvial Processes** (Prereq. 16.201) 4 Q.H.  
A study of streams: their hydraulics, erosion, transportation, and deposition of sediment, channel shape and pattern, and drainage basin analysis.
- 16.235 Landform Interpretation** 4 Q.H.  
The origin and evolution of landscapes which may be interpreted on the basis of the size, shape, orientations, composition, and distribution of topographic features. Particular attention is given to the effects of different climates on landscape evolution. The use of topographic maps, geologic maps, and stereo-aerial photographs is emphasized.
- 16.241 Structural Geology** (Prereq. 16.201) 4 Q.H.\*  
The fundamentals of rock structure and the mechanics of rock deformation. Folds, faults, joints, and cleavage, and their importance in geological interpretation. Analysis of structures in the field. Laboratory work consists of three-dimensional problems involving structural concepts.

**16.243 Regional Tectonics**

(Prereq. 16.201, 16.202) 4 Q.H.

Structural features and orogeny within the framework of major tectonic belts, and the evolution of these belts through geologic history.

**16.245 Economic Geology**

(Prereq. 16.211 or Dept. approval) 4 Q.H.

The genesis, associations, and occurrence of the major ore minerals, illustrated by studies of selected ore bodies of various types throughout the world.

**16.246 Field Geology**

(Prereq. 16.201) 4 Q.H.\*

Field techniques as a working guide for the approach, pursuit, and solution of geologic problems. Among the techniques considered are geologic map construction, stratigraphic section measurement, and field rock description. The laboratory consists of field research at a quarry, roadcut, or other geologic exposure.

**16.251 Paleontology**

(Prereq. 16.202) 4 Q.H.

Survey of important invertebrate phyla preserved in the geologic record. Correlation, evolution, paleoecology, and other biologic concepts are applied to fossil organisms.

**16.261 Advanced General Geology**

(Prereq. 16.201, 16.202) 4 Q.H.

An introduction to new and advanced concepts, theories, and hypotheses in geology. Students participate actively in discussions, research papers, and individual projects. Topics may include: continental drift, sea floor spreading, uniformitarianism, peneplanation, evolution, origin of magma, and origin and geologic history of the moon.

**16.271 Geology Seminar**

(Prereq. Major in Geology or senior status) 4 Q.H.

An in-depth study, on an individual or small-group basis, of a selected geologic topic. Both oral and written presentations are required.

**16.287, 16.288 Undergraduate Research**

(each) 4 Q.H.

Independent research on a selected topic under the direct supervision of a faculty member. Open only to juniors and seniors majoring in Geology, with the recommendation of the supervising faculty member and the department.

**16.290, 16.291 Directed Study**

(each) 4 Q.H.

Independent study of a specific topic not normally contained in the regular course offerings, but within the area of competence of a faculty member. Open to all students with the recommendation of a faculty member and departmental approval.

**16.292, 16.293 Special Studies**

(each) 1 Q.H.

Independent study of a specific topic. Open to all students with the recommendation of a faculty member and departmental approval.

**16.295, 16.296, 16.297, 16.298 Junior-Senior Honors Program**

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Biology

**18.114 Functional Human Anatomy I**

5 Q.H.\*

Cellular and tissue structure and function, followed by anatomical terminology. Histology, anatomy, and physiology of bones, muscles, blood, and nervous systems. The laboratory includes a study of human bones, cat dissection, and related histology.

**18.115 Functional Human Anatomy II**

(Prereq. 18.114) 5 Q.H.\*

Anatomy and physiology of the respiratory, digestive, urogenital, and circulatory systems. Physiology of endocrine system and a brief anatomy and physiology of eye and ear. The laboratory includes studies of muscle and nerve physiology, blood physiology and histology, and physiology of respiration.

**18.117 Human Biology**

3 Q.H.

General biological principles applied to and illustrated by the human species; human cellular structure and basic metabolic processes; human genetics, human reproduction, human evolution, human ecology and interactions with other species of plants and animals.

\*Including lab.

- 18.118 Organic Evolution** 4 Q.H.  
The major features of organic evolution, with emphasis on vertebrate evolution, genetics, and physical influences.
- 18.119 Environment and Man** 4 Q.H.  
An ecological analysis of the human situation and of man's interaction with other organisms. The necessary foundation of biological principles will be presented.
- 18.120 Basic Microbiology** 4 Q.H.\*  
Microbial life, emphasizing morphological characteristics, physiological activities, and disease production.
- 18.121 Introductory Microbiology** 3 Q.H.  
Same as 18.120, but without laboratory.
- 18.123 Biology of Human Reproduction** 4 Q.H.  
Structure and function of male and female reproductive systems; factors affecting sexual development, fertility, and reproductive behavior in the human species. Physiology of coitus, fertilization, pregnancy, birth, and lactation. Methods of controlling fertility.
- 18.124 Introductory Seminar in Biology** (Concurrently with 18.131) 1 Q.H.  
Seminar designed to enrich the freshman Biology major's program by in-depth readings in a specific area of biology and small group discussions with a faculty member interested in that area. Limited to and required of freshmen who plan to major in Biology.
- 18.131 General Biology** 4 Q.H.\*  
Universal properties and processes of living organisms. Cellular composition and cellular activities, inheritance and cellular control, the evolutionary process, environmental relationships.
- 18.132 Animal Biology** (Prereq. 18.131) 4 Q.H.\*  
Systematic comparative study of the structure and functions of animals. Diversity of animals considered from the standpoint of evolutionary adaptation.
- 18.133 Plant Biology** (Prereq. 18.131-18.132) 4 Q.H.\*  
Introduction to the structure of plant cells; structure and function of roots, stems, and leaves of flowering plants; survey of the major groups in the plant kingdom, including their morphology, reproductive biology, and economic importance.
- 18.134 Environmental and Population Biology** (Prereq. 18.131-18.133) 4 Q.H.\*  
Detailed consideration of the physico-chemical factors influencing and influenced by organisms. Interactions among individual organisms and among species. Change of species by genetic natural selection. Development of communities and function of ecosystems.
- 18.135 Genetics and Development Biology** (Prereq. 18.131-18.133) 4 Q.H.\*  
Elaboration of the classic laws of heredity. Cytogenetics. Chemical basis of heredity. Selected examples of the development of form and function.
- 18.136 Cell Physiology and Biochemistry (formerly Cell Biology)** (Prereq. 18.131-18.133; 12.171) 4 Q.H.\*  
Basic chemical and physical processes of cells related to their fine structure; oxidative and intermediary metabolism; photosynthesis, membrane phenomena; chemical and physical processes of prokaryotic and eukaryotic cells.
- 18.141 Basic Animal Biology I** 4 Q.H.\*  
Principles of biology. Universal properties and processes of living organisms as exemplified by the cell and its activities. Inheritance, evolution, and environmental relationships.
- 18.142 Basic Animal Biology II** (Prereq. 18.141) 4 Q.H.\*  
Structure and function of organ systems and animals. Diversity of animals considered from the evolutionary standpoint.
- 18.143 Human Physiology I** (Prereq. 18.131-18.132) 4 Q.H.\*  
Physiology of excitable cells and tissues: nerve and muscle, synapses, muscular contraction, neuromuscular reflexes, autonomic nervous system. Circulation: fluids, the heart, car-

diovascular regulatory mechanisms.

**18.144 Human Physiology II**

(Prereq. 18.143) 4 Q.H.\*

Respiration, endocrinology and metabolism, gastrointestinal function, renal function, sensory physiology and higher nervous function.

**18.145 Human Anatomy and Physiology I**

4 Q.H.\*

Lecture—structure of the human organ systems. Physiology of muscle and of the nervous system; control of voluntary movement, autonomic control, sensation. Laboratory—anatomy, based on dissections of a representative mammal and comparison with human models; microscopic anatomy of selected organs.

**18.146 Human Anatomy and Physiology II**

(Prereq. 18.145) 4 Q.H.\*

Lecture—human physiology based on the concept of the homeostatic state; functions of the blood and circulatory system, immunity, digestion, nutrition, respiration, excretion, reproduction, endocrine controls of the preceding processes. Laboratory—experiments demonstrating selected physiological phenomena in humans or representative animals.

**18.148 Human Anatomy**

4 Q.H.\*

The structure and development of the human body.

**18.158 Vertebrate Physiology I**

(Prereq. 18.131-18.133, 18.136) 4 Q.H.\*

Properties of living protoplasm; the general organization and function of cells; translocation of materials and the organization of animals; the physiology of the skeletal systems of man and animals; the physiology of amoeboid, ciliary and contractile movement with emphasis on muscle metabolism; the structure and function of neurons, reflex arcs, the autonomic nervous system, and the sensory receptors.

**18.159 Vertebrate Physiology II**

(Prereq. 18.158) 4 Q.H.\*

Fluid media of animals, emphasizing water and electrolyte balance and kidney function in man; the physiology of blood, including its formation, functions, clotting antigens and tests for identifying blood; the physiology of the heart, nervous control of the vascular system, breathing and gas transport, heat regulation, nutrition, digestion and assimilation; the endocrine secretions, and the physiologic aspects of reproduction.

**18.206 Evolution**

(Prereq. 18.131-18.135) 4 Q.H.\*

A basic evolutionary course for biology majors and graduate students. A survey of evolutionary history, evidence, mechanisms, and theories. Topics of current interest in evolution will be emphasized.

**18.207 Vertebrate Zoology**

(Prereq. 18.131-18.134) 4 Q.H.\*

Lectures emphasize the systematics, natural history, zoogeography, and behavior of all classes of vertebrates. The laboratory consists of identification and preparation of preserved and stuffed specimens, mandatory collecting, field and museum trips.

**18.208 Comparative Vertebrate Anatomy**

(Prereq. 18.131 and 18.132) 5 Q.H.\*

Morphology and phylogeny of the vertebrates; laboratory studies on taxonomy of the group and specific morphology of the dogfish shark, the mud puppy, the alligator and the cat.

**18.209 Embryology**

(Prereq. 18.131, 18.132, 18.135) 5 Q.H.\*

Gametogenesis, fertilization, cleavage, gastrulation, induction, organogenesis, and metamorphosis in vertebrates. Emphasis on frog, chick, and pig in the laboratory.

**18.210 Invertebrate Zoology**

(Prereq. 18.131-18.133) 5 Q.H.\*

Functional morphology, systematics, ecology and phylogenetic relationships of the major invertebrate phyla. Emphasis in laboratory on utilization of living marine forms, with dissection of representative organisms.

**18.211 Parasitology**

(Prereq. 18.131, 18.136) 4 Q.H.\*

Symbiotic relationships of protozoans, mesozoans, flatworms, nematodes, acanthocephalans, and arthropods.

**18.212 Vertebrate Paleontology**

(Prereq. 18.131, 18.132, 18.134, 18.135 or permission of the instructor) 4 Q.H.\*  
Evolution of the vertebrates, including man, as revealed through the fossil record. Laboratory, museum, and field studies.

**18.213 Mammalogy**

(Prereq. Biology Core or permission of the instructor) 4 Q.H.\*  
Phylogeny, anatomy, physiology, behavior, reproduction, population dynamics and natural history of the mammals. Field collection and laboratory preparation and study of specimens will be included.

**18.220 General Microbiology**

(Prereq. or Coreq. 12.145, 18.135, 18.136 or permission of the instructor) 5 Q.H.\*  
Morphological, ecological and biochemical consideration of representative groups of bacteria; introductions to virology and microbial genetics; host-parasite relationships including basic immunological considerations; procaryotes of medical significance; physical and chemical controls of microbial growth.

**18.221 General Microbiology**

(Prereq. or Coreq. 12.145, 18.135, 18.136 or permission of the instructor) 3 Q.H.\*  
Same as 18.220, but without laboratory. Not applicable for the Biology major or graduate credit.

**18.227 Animal Histology**

(Prereq. 18.132) 4 Q.H.\*  
Microscopic study of fundamental types of animal tissues.

**18.228 Histological Technique**

(Prereq. 18.131, 18.136) 3 Q.H.\*  
General methods of tissue preparation for purposes of microscopic study; preparation of solutions and stains; the microtome and its operation, together with specific directions for fixation, clearing, hardening, embedding, section-cutting, and staining of tissues.

**18.231 Lower Plants**

(Prereq. 18.133) 4 Q.H.\*  
Study of non-vascular plants (algae, fungi, lichens, mosses, and liverworts), including their morphology, ultrastructure, ecology, life cycles, reproductive strategies, and economic uses.

**18.232 Higher Plants**

(Prereq. 18.133) 4 Q.H.\*  
Study of vascular plants (club mosses, ferns, gymnosperms and angiosperms). Origin, ecology development, structure, paleobotanical evidence, reproductive strategies, and economic uses. Field trips included.

**18.234 Plant Anatomy**

(Prereq. 18.133) 4 Q.H.\*  
Comparative developmental anatomy of seed plants.

**18.235 Economic Botany**

(Prereq. 18.133) 4 Q.H.\*  
Structure, distribution, and cultivation of economic plants, food, and medicinal plants, including those producing fibers, sugars, starches, rubber, gums, spices, and beverages.

**18.236 Horticulture**

(Prereq. 18.133 or equiv.) 4 Q.H.\*  
Basic cultivation methods for ornamental and food plants. Offered at the University Greenhouse.

**18.237 Introduction to Plant Physiology**

(Prereq. 18.133) 5 Q.H.\*  
Physiological processes in plants at the cellular and organ levels including water relations, mineral nutrition, photosynthesis, respiration, protein and fat synthesis, growth, plant hormones, and development.

**18.238 Local Flora**

(Prereq. 18.133) 4 Q.H.\*  
Local vascular flora (ferns, gymnosperms, and angiosperms) is examined with emphasis on recognition and appreciation of plant family characteristics. Preparation of herbarium specimens is presented. Field trip attendance is required.

**18.239 Terrestrial Ecosystems of North America**

(Prereq. 18.133 or permission of the instructor) 4 Q.H.\*  
The major ecosystems of North America are examined with emphasis on species diversity, productivity, origin, history, and geographical location. Primary emphasis is placed upon

vegetation. Field trips are required and will be arranged with students after the first class meeting.

**18.240 Microbial Physiology** (Prereq. 18.220 or equiv.) 4 Q.H.\*

Structure and function of the bacterial cell. General properties of bacteria as well as physical and chemical factors influencing them are stressed.

**18.242 Medical Microbiology** (Prereq. 18.220 or equiv.) 4 Q.H.\*

The bacterial cell as a pathogen, stressing major genera of disease-producing organisms and factors influencing virulence.

**18.245 Serology-Immunology** (Prereq. 18.220 or equiv.) 3 Q.H.

Basic consideration for physical and chemical attributes of antigens and antibodies. Antigens of biological significance as well as in-vivo antigen-antibody interactions will be discussed.

**18.246 Serology-Immunology Laboratory** (Prereq. or Coreq. 18.245) 2 Q.H.\*

Laboratory exercises dealing with immunization; quantitative antigen-antibody reactions; electrophoretic studies (agar, acrylamide gel, and cellulose acetate); immuno fluorescence.

**18.248 Marine and Fresh Water Microbiology I** (Prereq. 18.220) 2 Q.H.\*

Methodological approaches to the study of the aquatic environment. Shipboard sampling and relevant field-trips augment laboratory studies.

**18.249 Marine and Fresh Water Microbiology II** (Prereq. 18.220) 2 Q.H.

Characterization and differentiation of aquatic micro-organisms. Microbial association in marine, estuarine, and fresh water habitats. Morphology, physiology and ecology is stressed.

**18.251 Comparative Animal Physiology** (Prereq. 18.132, 18.136 or equivs.) 4 Q.H.\*

Study of animal functions, their control, and their adaptiveness to various environments. Consideration of phylogeny of these adaptations and of their underlying cellular mechanisms. Emphasis on invertebrates and lower vertebrates, with comparisons to mammals.

**18.280 Senior Seminar**

(Prereq. Completion of core biology program, 18.131-18.136) 1 Q.H.

Recent developments in various topics of zoology, microbiology, physiology, botany, ecology, genetics, and cell biology. Student presentation and analysis is emphasized. Limited to qualified juniors and seniors in the B.A. program and required of seniors in the B.S. program.

**18.290, 18.291 Directed Study**

(Prereq. Completion of core biology program, 18.131-18.136) (each) 2 Q.H.

Independent work on a chosen topic under the direction of members of the Department. Limited to qualified juniors and seniors with approval of the Department and special arrangements with the supervising faculty member. The two quarters of this course together are counted as one elective course in the Biology Department.

**18.295, 18.296, 18.197, 18.298 Junior-Senior Honors Program** (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Psychology

For specific scheduling information, students should request a current course listing at the Psychology Department Main Office, 440 UR.

Students should note that course numbers below are sometimes presented out of numerical sequence, to reflect subject areas and levels of study most clearly.

**19.100 Foundations of Psychology Roundtable** 1 Q.H.

It is recommended that students enrolled in 19.105, 106, Foundations of Psychology I or II, also enroll in a weekly roundtable with faculty members from the Psychology and other allied departments to discuss their current research and other pertinent matters. Discussions

provide personal interaction with a large group of Psychology faculty members, and help students to gain broad acquaintance with the field and advanced course options.

**19.105 Foundations of Psychology I** 4 Q.H.

Topics include: the observation of behavior, classical and operant conditioning, clinical applications of learning theory, sensation and perception, the physiological substrata of behavior. The basic principles of psychological analysis are taught by a personalized interactive method, using videotapes, progress quizzes, one-to-one study tutorials and optional small-group discussions. The student can study at his/her own pace, within flexible calendar limits, and class hours are not preassigned.

**19.106 Foundations of Psychology II** (Prereq. 19.105) 4 Q.H.

A continuation of 19.105, featuring a sequence of graded reading assignments and tutorial sessions, with frequent self-evaluation of study progress. Topics include: analysis of behavior as applied to education, personality and behavior disorders, brain damage and language, sensory processes, ethology and aggression.

**19.120 Statistics in Behavioral Science I** 4 Q.H.

Introduction to descriptive statistics (scales of measurement, frequency distribution and graphs, measures of central tendency, dispersion and correlation, standard scores and the unit normal curve), and probability theory (permutations, combinations and the binomial theorem). This "self-paced" course features a tutorial system that encourages the most advanced students to join in the teaching process by working as "peer-tutors" with the rest of the class. Sequence of carefully constructed work-problems supplemented by progress checks, tutorials, and small-group review sessions.

**19.121 Statistics in Behavioral Science II** (Prereq. 19.120) 4 Q.H.

General presentation of hypothesis testing, including parametric and nonparametric tests, with emphasis on formulating hypotheses and choosing appropriate scales of measurement, tests, and confidence levels. (Continuation of 19.120 with the same format.)

**19.130 Social Psychology** (Prereq. 19.106) 4 Q.H.

Introductory survey of social psychology from the viewpoint of human information processing. Topics include: interpersonal interactions, group dynamics, attitude formulation and change, social variables in communication.

**19.135 Personality I** (Prereq. 19.106) 4 Q.H.

Systematic study of the normal personality, its growth and development. Topics include: environmental and constitutional contributions, assessment of personality, research, and a survey of the major theories of personality.

**19.136 Personality II** (Prereq. 19.135) 4 Q.H.

Continuation of 19.135.

**19.138 Experimental Personality** (Prereq. 19.121 and 19.135) 4 Q.H.

Introduction to methods and areas of personality research. Includes problems of measurement, behavioral and dynamic concepts, and a laboratory project.

**19.141 Human Behavioral Development I** (Prereq. 19.106) 4 Q.H.

Various approaches to the study of human development (from the baby diary to the experiment) are examined. Includes study of biological bases of behavioral development, sensory and motor function, learning, socialization, speech and language, imitation, dependency, aggression, and abnormalities of development. The general heredity/environment question is studied and gives rise to assessment of twin studies and selective breeding experiments. A personalized course in which students progress at their own rate, with frequent evaluations of progress, immediate feedback, and tutorial assistance.

**19.142 Human Behavioral Development II** (Prereq. 19.141) 4 Q.H.

Continuation of 19.141 with emphasis on adolescence and adulthood.

**19.149 Sensation and Perception I** (Prereq. 19.106) 4 Q.H.

Introduction to the study of our senses, with emphasis on hearing, touch, taste, and smell.

Students learn how we measure our sensory abilities. Findings are closely related to the functioning of sensory organs—ears, skin, mouth, and nose—and of the sensory nervous system. The course is built around one lecture-demonstration a week plus a textbook and study guide. Students pass mastery quizzes and work closely with peer-tutors in a modified personalized system of instruction.

**19.150 Sensation and Perception II** (Prereq. 19.120 and 19.149) 4 Q.H.

Continuation of 19.149 with primary emphasis on vision. Topics include: light, the eye, brightness, acuity, color, space perception, size perception, movement perception, and pattern perception.

**19.155 Psychology of Language** (Prereq. 19.106) 4 Q.H.

Introduction to theories, research methods, and findings in experimental, developmental, and cross-cultural psycholinguistics; role of the sound system, syntax, and semantics in perception, thought, memory, and communication.

**19.156 Psychology of Thought** (Prereq. 19.106) 4 Q.H.

Psychological factors in problem solving, imagination, intuition, information processing, and concept learning.

**19.157 Cognition** (Prereq. 19.106) 4 Q.H.

Introduction to cognitive psychology with emphasis on the analysis of memory, perception, language, and learning within an information processing framework. Also theories of cognitive development as they relate.

**19.158 Cognition Laboratory** (Prereq. 19.121 and 19.157) 4 Q.H.

Experiments on topics in 19.157.

**19.160 Experimental Design In Psychology** (Prereq. 19.106 and 19.121) 4 Q.H.

Concentration upon the experimental method in the design, execution, analysis, and reporting of psychological investigations of humans and animals.

**19.162 Sensation and Perception Laboratory** (Prereq. 19.120 and 19.149) 4 Q.H.

Laboratory experiments on seeing, hearing, touching, and tasting. Studies may include: dark adaptation, loudness, binaural interaction, brightness constancy, two-point touch thresholds, information processing and interactions between the senses.

**19.164 Learning and Motivation** (Prereq. 19.106) 4 Q.H.

Application of basic behavioral principles to behavioral development, behavior modification, language development, and programmed learning, and their relations to theoretical considerations in the learning process.

**19.165 Learning Laboratory** (Prereq. 19.164) 4 Q.H.

Through direct experience, students gain proficiency in laboratory analysis of behavior and in evaluating common generalizations about human behavior. Students design and perform experiments in animal and human learning, memory, decision processes, concept formation, and other topics of individual interest.

**19.166 Introduction to Programmed Learning**

(Prereq. 19.165 and permission of the instructor) 4 Q.H.

Development of programmed instruction has been one of the products of basic behavioral research. After students master relevant basic research literature, they review and evaluate existing instructional programs in the light of the underlying behavioral principles. Programs to be examined are selected from those useful in the normal and special education classrooms, complex academic subject matter and individual problem areas.

**19.167 Program Design and Application**

(Prereq. 19.166 and permission of the instructor) 4 Q.H.

Students design, test, and evaluate their own instructional programs for teaching specific subject matter, or for remedial application to behavior problems, or to test basic instructional theory.

**19.168 Behavior Change in Institutions** (Prereq. 19.106) 4 Q.H.

Study of successful projects which have been carried out to provide effective remediation and



rehabilitation in institutions for the mentally ill, the mentally retarded, and the developing human (schools).

**19.169 Punishment and Anxiety** (Prereq. 19.165) 4 Q.H.

How do coercion and aversive consequences influence individual behavior and social interaction? The experimental evidence is surveyed, including an examination of avoidance behavior, escape behavior, and the development of anxiety, as they occur under conditions of coercion.

**19.170 Language Abnormalities** (Prereq. 19.155) 4 Q.H.

Psycholinguistic methods and findings in the study of aphasia, stuttering, dyslexia, language of the retarded, and other language pathologies.

**19.171 Behavior Modification Laboratory**

(Prereq. 19.165 and permission of the instructor) 4 Q.H.

Students participate in education and training of severely and profoundly retarded residents at the Walter E. Fernald State School. Learning theory principles are applied to the teaching of new skills and to the treatment of inappropriate behaviors. Students write individual and group training programs, implement them in a classroom setting, and learn methods for evaluating program success.

**19.172 Applied Behavior Modification**

(Prereq. 19.171 and permission of the instructor) 4 Q.H.

Continuation of 19.171.

**19.178 Physiological Basis of Psychology I** (Prereq. 19.106) 4 Q.H.

How nerves function and work together in the nervous system; how our sense organs provide the brain with information about the outside world; how the brain acts to produce externally observable behavior; and how such psychological concepts as perception, learning, motivation, arousal, and emotion may relate to nervous system activity.

**19.179 Physiological Basis of Psychology II** (Prereq. 19.178) 4 Q.H.

Continuation of 19.178.

**19.180 Seminar in Physiological Psychology** (Prereq. 19.179) 4 Q.H.

For students who desire intensive study, discussion and practice in laboratory studies of physiological variables. Topics include: evolution of the nervous system, sensory and motor mechanisms, motivation and emotion, sleep, attention and perception, learning, and memory.

**19.181 Laboratory in Physiological Psychology** (Prereq. 19.179) 4 Q.H.

Laboratory experiments based on 19.180 discussion topics.

**19.183 Biological Bases of Motivation** (Prereq. 19.179) 4 Q.H.

Focuses on the mechanisms of eating and drinking behavior, attention, sleep, arousal, and emotional behavior.

**19.186 Comparative Psychology and Ethology**

(Prereq. 19.106 and 18.133 or 18.141) 4 Q.H.

Concerned with the increasing complexity of behavior as we move from simple organisms to primates. Special attention is focused on experimental approach to instinctive, maternal, emotional, and problem-solving behavior. The constitutional vs. environmental factors in behavior are discussed and studied in terms of phylogenetic development.

**19.187 Sensory Physiology Seminar** (Prereq. 19.179) 4 Q.H.

Concentrates on the psychophysiology of various sensory systems. Discussions are concerned with the problem of accounting for sensory phenomena in terms of physiological concepts. Particular attention is given to the senses of vision and hearing.

**19.188 Sensory Physiology Laboratory** (Prereq. 19.179) 4 Q.H.

Experiments performed to illustrate the physiological techniques in sensory psychology including electrical recordings of some activities that accompany visual, auditory, and cutaneous activity.

**19.192 Sensory and Perceptual Abnormalities**

(Prereq. 19.150) 4 Q.H.

Consideration of some of the peripheral factors which influence perception of the external world. Discussions consider how sensory deficits can influence behavior and some of the means for dealing with sensory and perceptual abnormalities. Application of programmed instruction to the development of sensory tests and remedial procedures for nonverbal people, blind or deaf retarded people, young children who have not yet learned to speak, and aphasic patients; the detection of hysterical sensory loss and malingering.

**19.193 Neuroanatomy I**

(Prereq. 19.106) 4 Q.H.

Aimed primarily at the study of the human nervous system. Study of the cellular structure of the nervous system, including a cell's organelles, followed by a short study of the embryological development of the nervous system. Systematic study of the nervous system beginning in the spinal cord and ending in the cerebral cortex with primary emphasis on fiber connections. A continuous attempt to correlate structure with behavioral activity.

**19.194 Neuroanatomy II**

(Prereq. 19.193) 4 Q.H.

Continuation of Neuroanatomy I.

**19.195 Laboratory in Psycholinguistics (formerly Language Laboratory)**

(Prereq. 19.121 and 19.155) 4 Q.H.

Students perform experiments that examine effects of sound system, syntax, and semantics on perception, memory and communication.

**19.196 American Sign Language and Nonverbal Communication I**

4 Q.H.

Introduction to the American Sign Language of the Deaf: elementary vocabulary, syntax, and idioms. ASL is contrasted with other forms of nonvocal communication such as fingerspelling, signing exact English, and pantomime.

**19.199 American Sign Language and Nonverbal Communication II**

(Prereq. 19.196) 4 Q.H.

Continuation of 19.196, emphasizing vocabulary expansion, more complex grammatical structures and style. Issues in sociolinguistics, bilingualism, and recent research on ASL structure and function are introduced.

**19.202 Abnormal Psychology I**

(Prereq. 19.135 or 19.141) 4 Q.H.

Discussions and study of the abnormal personality, historical background, criteria of abnormality, theoretical framework of normal and abnormal development, anxiety and defense, etiology, dynamics and symptomatology of the neuroses.

**19.203 Abnormal Psychology II**

(Prereq. 19.202) 4 Q.H.

Survey of psychotherapeutic techniques; etiology, dynamics and symptomatology of the psychoses; psychosomatic, sociopathic, and organic disorders in the context of personality problems.

**19.210 Scientific Foundations of Psychology (formerly History of Psychology)**

(Prereq. Junior or senior standing) 4 Q.H.

Evaluation of modern psychology in the light of its historical origins. Designed especially for Psychology majors who are preparing for graduate school admissions and/or civil service examinations, both of which emphasize familiarity with historical issues, the work of major contributors to psychology, and the methods, data and theoretical systems they developed. Students often find this course most useful when taken at the end of the junior year or start of the senior year, shortly before the relevant examinations are scheduled.

**TEACHING PRACTICA**

Students who have mastered one of the department's self-paced courses may request permission to enroll in the correlated Teaching Practicum, with elective credit applicable to the major within limits noted in major requirements in the Liberal Arts Handbook. Students learn how to design instructional materials, give tutorials, and solve study problems in the subject matter of the correlated self-paced course. The practica include a series of seminar discussions on teaching problems and techniques.

**19.250 Teaching Practicum in Foundations of Psychology I**

(Prereq. 19.105 and permission of the instructor) 4 Q.H.

Students learn both practical teaching skills as well as theoretical principles associated with personalized instruction. Teaching responsibilities include interactions with students in 19.105 for four hours each week. In addition, a special Saturday conference and weekly staff seminars will acquaint the undergraduate with relevant literature and provide opportunity for discussion.

**19.251 Advanced Teaching Practicum in Course 19.105**

(Prereq. 19.250 and permission of the instructor) 4 Q.H.

Students who have mastered elementary teaching skills in 19.250 will have an opportunity to design and evaluate programming techniques which can be applied to college-level instruction. In addition to limited tutorial responsibilities, each 19.251 student will evaluate and assist the less sophisticated peer-tutor. Students will also direct seminar discussions of individually designed teaching programs in the context of representative samples of the programming literature.

**19.252 Teaching Practicum in Foundations of Psychology II**

(Prereq. 19.106) 4 Q.H.

Basic principles of PSI will be covered in a peer-tutor workshop during the first week of the quarter. Undergraduates will apply these principles for the remainder of the quarter during personalized tutorial sessions with 19.106 students. In addition, students will show mastery of course material by retaking unit quizzes and the final exam. They will be encouraged to offer suggestions for modifying course material and procedures during weekly meetings with the course instructor. Tutors will be required to submit two five-minute, tape-recorded segments of actual tutorials for evaluation. They will also be required to write an evaluative essay on the PSI method of instruction.

**19.253 Advanced Teaching Practicum in Course 19.105**

(Prereq. 19.252 and permission of the instructor) 4 Q.H.

In addition to tutoring, students will assist new tutors and will help other undergraduates who have special problems.

**19.254 Teaching Practicum in Statistics in Behavioral Science I**

(Prereq. 19.120 and permission of the instructor) 4 Q.H.

Using the PSI approach, students will learn the principles of teaching introductory statistics and will apply them by conducting a series of personalized tutoring sessions with others enrolled in 19.120.

**19.255 Advanced Teaching Practicum in Statistics in Behavioral Science I**

(Prereq. 19.254 and permission of the instructor) 4 Q.H.

Students will conduct a series of tutoring sessions in introductory statistics, assist new tutors, and deal with other undergraduates who have special problems. In addition, they will learn to design PSI material related to descriptive statistics, simple probability, correlation, and regression.

**19.256 Teaching Practicum in Statistics in Behavioral Science II**

(Prereq. 19.121 and permission of the instructor) 4 Q.H.

Students will learn the principles of the PSI system as applied to the teaching of inferential statistics. They will apply these principles concurrently by conducting a series of tutoring sessions with others enrolled in 19.121.

**19.257 Advanced Teaching Practicum in Statistics in Behavioral Science II**

(Prereq. 19.256 and permission of the instructor) 4 Q.H.

Students will conduct series of tutoring sessions in inferential statistics, deal with others who have special problems, and assist new tutors. In addition, they will be required to re-design one of the course units related to parametric or nonparametric statistical tests.

**19.258 Teaching Practicum in Human Behavioral Development I**

(Prereq. 19.141 and permission of the instructor) 4 Q.H.

Students will study, discuss, and apply the principles underlying the PSI method. They will conduct tutorials throughout the quarter. At weekly seminars, the course content and its

relation to students' performances will be discussed, and changes in course content will be suggested and evaluated.

#### **19.259 Advanced Teaching Practicum in Human Behavioral Development I**

(Prereq. 19.258 and permission of the instructor) 4 Q.H.

In addition to limited tutorial responsibilities, each student will evaluate and assist new tutors, and learn to design materials for teaching human behavioral development.

#### **19.260 Teaching Practicum in Sensation and Perception I**

(Prereq. 19.149 and permission of the instructor) 4 Q.H.

Students will attend a peer-tutor workshop during the first week of the quarter to review the basic principles of PSI. They will apply these principles for at least two hours per week, by tutoring others. The peer-tutor will maintain a log-book describing his/her activities, and will be encouraged to offer suggestions for modifying course material and procedures. These suggestions will be discussed with the course instructor at weekly peer-tutor meetings. Before the end of the quarter, each peer-tutor will be required to submit for evaluation a five-minute tape recorded segment of an actual tutoring session, as well as a short, evaluative essay summarizing his/her experiences with the PSI system as applied to Perception.

#### **19.261 Advanced Teaching Practicum in Sensation and Perception I**

(Prereq. 19.260 and permission of the instructor) 4 Q.H.

Peer-tutors will assist new colleagues by helping in the tutorial workshop and by dealing with students in the course who have special problems (e.g., multiple quiz failures). Advanced tutors will also be required to re-design or revise one of the course units. After review by the course instructor, the new unit and quizzes will be tested in the course, and the tutor will write an evaluative report on the unit's effectiveness as a teaching device.

#### **19.262 Teaching Practicum in Sensation and Perception II**

(Prereq. 19.150 and permission of the instructor) 4 Q.H.

Same as 19.260 but with emphasis on visual perception.

#### **19.263 Advanced Teaching Practicum in Sensation and Perception I**

(Prereq. 19.260 and permission of the instructor) 4 Q.H.

Same as 19.261 but with emphasis on visual perception.

#### **19.264 Teaching Practicum in Learning Laboratory**

(Prereq. 19.165 and permission of the instructor) 4 Q.H.

Each student will learn to apply skills of peer-tutoring in the Learning Laboratory (19.165). By administering, evaluating, and discussing oral and written quizzes on laboratory methodology, report writing, and readings, tutors will provide students with immediate, daily feedback about their progress through each experiment. At weekly meetings with the instructor, each tutor will provide a written progress report for a subset of students. On the basis of these reports, each tutor will also make written recommendations for specific students and for improvement of the course content and design.

#### **19.265 Advanced Teaching Practicum in Learning Laboratory**

(Prereq. 19.264 and permission of the instructor) 4 Q.H.

Students will examine the theory of contingency managed instruction (CMI) as it applies to the Learning Laboratory (19.165). They will supervise peer-tutors, critically examine the Learning Laboratory course in the context of the current CMI literature, and recommend changes in both course content and design.

#### **19.266 Teaching Practicum in Learning and Motivation**

(Prereq. 19.164 and permission of the instructor) 4 Q.H.

Peer-tutors will work with students in 19.164. Responsibilities include four hours of tutorial work per week on quizzes, readings, study guides and lab visits, and a one-hour tutors' meeting for reviewing course procedures and content. Tutorial work is designed to help students prepare for weekly interviews with the instructor.

#### **19.267 Advanced Teaching Practicum in Learning and Motivation**

(Prereq. 19.266 and permission of the instructor) 4 Q.H.

Responsibilities are the same as those for 19.266, except that tutors also will participate in

revising course content and procedures and will do advanced level readings that will be discussed at weekly tutors' meetings.

**19.268 Teaching Practicum in Human Behavioral Development II**  
(Prereq. 19.142 and permission of the instructor) 4 Q.H.  
Same as 19.258, but with emphasis on adolescence, adulthood, and senescence.

**19.269 Advanced Teaching Practicum in Human Behavioral Development II**  
(Prereq. 19.269 and permission of the instructor) 4 Q.H.  
Same as 19.259, but with emphasis on adolescence, adulthood, and senescence.

**19.271, 19.272 Seminars** (Prereq. 19.121 and 19.121) (each) 4 Q.H.

**19.273 Seminar in Clinical Psychology and Psychopathology** (Prereq. 19.203) 4 Q.H.  
Seminar presentations of topics of interest to clinically oriented psychologists. Possible topics are: specialized clinical syndromes (e.g., suicide, alcoholism, paranoia); specialized psychotherapies (group and family therapy); specialized assessment procedures (e.g., projective methods); intelligence and its assessment; social class and mental illness; anxiety and aggression on being hospitalized; and the role of the family in psychopathology.

**19.274, 19.275 Seminars** (Prereq. Permission of the instructor) (each) 4 Q.H.

**19.290, 19.291, 19.292, 19.293, 19.294 Directed Study**  
(Prereq. Permission of the instructor) 4 Q.H.

Independent work under the direction of the Psychology Department, usually in a research project in one of the Department laboratories. Faculty members usually require completion of advanced laboratory courses in the area of research interest, but this is a matter of individual discussion. Students interested in Directed Study should consult a departmental adviser.

**19.295, 19.296, 19.297, 19.298, 19.299 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Anthropology

**20.100 Principles of Social Anthropology** 4 Q.H.  
Basic principles.

**20.130 Language and Culture** 4 Q.H.  
The function of language in human society and an introduction to the relationship between the patterns of language and the patterns of culture.

**20.135 Individual and Culture** 4 Q.H.  
An exploration of the ways in which the individual is shaped by his society and the ways in which he can effect change.

**20.137 Culture and Mental Illness** 4 Q.H.  
Discussions and analyses of: the nature and meaning of culture; the role of culture in personality formation; culture and anxiety; anthropological approaches to the "normal" and the "abnormal"; and the question, "Is mental illness psychological fact or cultural fiction?".

**20.140 Evolution and Society** 4 Q.H.  
Human social and cultural evolution, and the theories which account for it.

**20.151 Aggression** 4 Q.H.  
Focuses on concepts of aggression and how they affect our understanding of human society. Draws on materials collected by anthropologists, psychologists and ethnologists.

**20.157 Primitive Religion** 4 Q.H.  
Nature and institutionalization of "primitive" religion. Exploration of religious concepts and movements in relation to social, economic, and political organization.

**20.158 The Anthropological Study of Myth** 4 Q.H.  
Theories concerning the nature and meaning of myth. Exploration of the function of myth in

social and cultural change. The structural analysis of myth.

**20.160 Sex, Sex Roles and Family**

4 Q.H.

Analyzes popular and scientific notions about sex and family by examining the social patterning of interactions in our culture, other cultures and other species. Emphasizes the changing relationships between men and women. (See also 21.121)

**20.170 Culture in Transition**

4 Q.H.

Analysis of the changing patterns in social, economic, and political institutions. Modern social trends are discussed.

**20.210 Tribal Societies and Cultures**

4 Q.H.

The structures and institutions of bands, tribes, and chiefdoms; comparative and functional studies of tribal societies and the dynamics of change under contact situations.

**20.214 Peasant Society and Culture**

4 Q.H.

Institutions of peasant society. The structure of traditional civilizations and the interrelations between urban and local communities; comparative and functional analysis of the peasant community and the dynamics of change from peasant to post-peasant and industrialized societies.

**20.220 Anthropology Methods**

4 Q.H.

Theory and practice of methods of field research and the analysis of data. Students take part in a field project.

**20.230 Language and Communication**

4 Q.H.

Human communication, including language, theories of the evolution of language; language and kinesics, semiotics, social class, linguistic nationalism; linguistic problems in modernization.

**20.240 Human Origins**

4 Q.H.

An intensive look at the data on fossil remains and contemporary primates which are essential for an understanding of human physical and behavioral evolution. Efforts are made to bring the student into direct contact with primary materials.

**20.245 Cultural Ecology**

4 Q.H.

An introduction to questions of human adaptation to environment and the effect of different adaptations on natural systems.

**20.250 Political Anthropology**

4 Q.H.

Origin and growth of the institutions of civilization. Specialization and social stratification in the dynamics of traditional civilizations; some special topics of contact and change.

**20.255 Economic Anthropology**

4 Q.H.

Types of economic systems in simple societies; reciprocal, redistributive, market exchange; economic relations as part of social relations; land tenure systems, credit systems, savings mechanisms. The transition from subsistence to cash economics.

**20.257 Religion and Myth**

4 Q.H.

Nature and institutionalization of primitive, ancient, and contemporary religions. Exploration of religious concepts and movements in relation to social, religious, and political organization.

**20.259 Urban Anthropology**

4 Q.H.

Selected problems in anthropological studies in urban societies.

**20.260 Kinship and Society**

4 Q.H.

This is a course for the advanced student only. A variety of kinship systems and their terminological and structural components, and the way in which their systems articulate with other social institutions.

**20.270 Social Change and Economic Development**

4 Q.H.

Selected studies of processes of transformation and modernization in non-industrial societies.

**20.280, 20.281, 20.282, 20.283, 20.284, 20.285, etc.**

(each) 4 Q.H.

Ethnographic area courses (New World Indian, Africa, India, Mediterranean, etc.) which will

be offered as the Department's resources permit.

**20.290, 20.291 Directed Study** (Prereq. Department approval) 4 Q.H.  
Independent work under the direction of members of the Department upon a chosen topic. Limited to qualified seniors preparing in anthropology with approval of the Department Chairman.

**20.295, 20.296, 20.297, 20.298 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

**20.801, 20.802 Theory**  
Qualified undergraduates may wish to take this course which is offered in the graduate school. Permission of the instructor is required for registration.

## Sociology

**21.100 Introduction to Sociology** 4 Q.H.

**21.103 Sociology of Boston** (Does not meet elective requirement for Soc./Anthr. major) 4 Q.H.

The city of Boston is studied from the perspectives of environmental development, neighborhood and intergroup relations, institutional services, and symbolic meanings. The city is a laboratory for exploring the people's search for a life style and the satisfaction of their needs. Field trips with workbook. Use documentary and literary sources for term paper report.

**21.107 Social Psychology** (Prereq. 21.100 or consent) 4 Q.H.  
A social psychological approach to individual behavior in social contexts; introduction to basic concepts, such as socialization, identity, self-concept, role conflict, attitudes, and attitude measurement, groups and group processes, as well as an overview of major theoretical orientations and important substantive topics.

**21.109 The Sociology of Everyday Life** (Prereq. 21.100 or equiv.) 4 Q.H.  
The development, application, and consequences of rules for everyday activities (e.g., walking, talking, eating, drinking, sitting, smoking, laughing, crying, and sleeping); the effects of space, equipment, and territory on these activities on social life; and the expression of the emotions.

**21.111 American Society** (Prereq. 21.100 or equiv.) 4 Q.H.  
American society, culture, and major social institutions; economic, religious, governmental, familial, education, welfare, and recreational; social classes and stratification, mobility, and individualism.

**21.112 Sociology of Poverty** (Prereq. 21.100 or consent) 4 Q.H.  
An analysis of American poverty in historical perspective, drawing on comparisons with other countries. Critical evaluation of sociological research and theories relating to poverty. Consideration of causes and effects of poverty, as well as societal responses to poverty and its consequences. Suitable for students in applied fields, such as nursing, criminal justice, education, allied health, pre-med, and pre-law.

**21.116 Environment and Society** (Prereq. 21.100 or equiv.) 4 Q.H.  
Traditional perceptions of environment and man, contrasting Judaeo-Christian and other cultures such as Southwest American Indian and Japanese. Origins of contemporary conservation movement and concern with resource management in America. Public policy and public response to such environmental issues as population, air and water pollution, waste disposal, and land management. Environmental quality as ideology and the search for measureable indicators. Implication of international approaches to the understanding and control of ecosystems.

**21.118 Population and Society**

(Prereq. 21.100 or equiv.) 4 Q.H.

Traditional and contemporary approaches to human population and its control. Factors affecting birth and death rates. Societal implications of population quantity and quality in several situations, past and present. Rural-urban migration and mobility; racial, genetic, stratificational components for population analysis. Public policies and public response to fertility control in several societies. International efforts to understand and generate action on population issues.

**21.120 Sociology of the Family**

(Prereq. 21.100 or equiv.) 4 Q.H.

The family as a social institution in several selected cultures; interrelations of the family and political, economic, and educational institutions; social nature of personality; role-taking; and the effects of individualism, mobility, and industrialism.

**21.121 Changing Sex Roles**

(Prereq. 21.100 or consent) 4 Q.H.

Review and application of theories about the determinants of sex statuses and roles, from an historical and cross-cultural perspective. The focus on the course is on women's status roles in different institutional structures of American society.

**21.131 Crime, Conflict, and Justice**

(Prereq. 21.100 or consent) 4 Q.H.

Analysis of social and political forces which create and perpetuate criminality in contemporary U.S. society; the impact of criminality upon law enforcement, judicial process, and the social order. Particular attention is devoted to violence as a means of resolving problems. In addition, this course examines the involvement of the legal system in processes of social conflict and change.

**21.132 Class, Crime and the Police**

(Prereq. 21.100 or consent) 4 Q.H.

The relationship between social class and crime, including power elite theory; class conflict; mobility patterns and value orientations. White collar, professional, and "political" crime is discussed as is the relationship between economic status and the functioning of the criminal justice system. The role of police and the interaction between law enforcement agents and deviants is analyzed, with emphasis on the potential for discriminatory application of the criminal law.

**21.135 Juvenile Delinquency**

(Prereq. 21.100 or equiv.) 4 Q.H.

The sociological and psychological approaches and their implications for a typology of delinquency; problems of prevention, treatment, and rehabilitation.

**21.137 Social Deviance I**

(Prereq. 21.100 or consent) 4 Q.H.

The conditions under which people categorize others as different; processes by which persons so defined are assigned deviant status and assume appropriate roles and self-images; development of deviant careers and their relationship to deviant subcultures; situations in which people transform deviant identity.

**21.138 Social Control I**

(Prereq. 21.100 or consent) 4 Q.H.

Formation of social bonds and the conditions under which they are ruptured; the emergence of deviance as an interactional problem; the types of individual and societal reactions to the most prevalent forms of deviant behavior. Analysis of agencies of social control, their definitions of problems, and responses to typical clients.

**21.139 Social Problems**

(Prereq. 21.100 or consent) 4 Q.H.

Analysis of five major sociological perspectives on social problems (pathology, disorganization, value-conflict, deviance, and labeling); the conditions under which certain recurrent events, activities, and persons become redefined as social problems, (e.g., mine disasters, marijuana smoking, and alcoholism); study of the typical responses to social problems and their consequences.

**21.141 Drugs and Society**

(Prereq. 21.100 or equiv.) 4 Q.H.

An introduction to the sociology of drugs. The course first examines social definitions of drugs, conditions of their use, and socialization into drug use. It then considers deviant drug use and effects of social control on definitions and use. A range of licit and illicit drugs will be considered but major emphasis will be given to alcohol, marihuana, and heroin.



**21.145 Urban Society** (Prereq. 21.100 or consent) 4 Q.H.

The foundations of city life in historical perspective; relationship of city life to environment, population, social organization, technology, and cultural values; growth trends, urbanization, and urban planning.

**21.150 Race and Ethnic Relations** (Prereq. 21.100 or equiv.) 4 Q.H.

Racial nationalities and religious groups, particularly with reference to the United States; special emphasis on historical development, specific problems of adjustment and assimilation, and specific present-day problems and trends.

**21.151 Sociology of Prejudice** (Prereq. 21.100 or consent) 4 Q.H.

Factors in the development and maintenance of prejudice and discrimination. Topics include: American race relations, anti-Semitism, sex roles, and stereotyping.

**21.155 Medical Sociology** (Prereq. 21.100 or consent) 4 Q.H.

An examination of the professions, training, institutions, and problems in health care, with an emphasis on the United States. Practical issues in the improvement of health care systems are considered.

**21.156 Health Care as a Social Issue** (Prereq. 21.100 or consent) 4 Q.H.

The social and political dynamics of health care: who benefits from the system and defends it, who works for change, who wins and why. Topics to include: the social history of health care, occupational politics, community power structure and health care setting, the planning and delivery of health services to "haves" and "have-nots," and the role of citizens in determining the future of health care through activism, lobbying, legislation, and participation in controlling the system. Case examples will be given.

**21.158 Death and Dying** (Prereq. 21.100 or consent) 4 Q.H.

The treatment of death and dying, including problems faced by health care professionals, family members, institutions, the funeral industry and the dying themselves. The course will discuss cross-cultural perspectives, social distribution of mortality, the changing nature of death, and the ethical problems in determining life and death with particular attention to such issues as abortion, suicide, and ceasing medical intervention.

**21.160 Social Class and Communication** (Prereq. 21.100 or consent) 4 Q.H.

Analysis of how groups and institutions in both their ritual and everyday activity communicate the idea of hierarchy and a person's place in it, through face-to-face interaction, formal communication, and the use of space and time. A dramaturgical approach to social organization with special emphasis on status images in the media and the communication of social place by service organizations and professional groups. Students will do some content analysis and observational fieldwork.

**21.164 Sociology of Work** (Prereq. 21.100 or consent) 4 Q.H.

Study of the world of work focusing on the development of occupational cultures, the nature of careers, and the meanings and implications of professionalization. As part of the course, students will be encouraged to do a project on an occupation they are considering for a career or one in which they have had practical experience on co-op.

**21.165 Industrialism and Industrial Man** (Prereq. 21.100 or consent) 4 Q.H.

The role of industry in modern society; similarities and dissimilarities among industrial societies, bureaucracy and its alternatives, unions, supervision democracy and manipulation, the man on the assembly line, sabotage of the organization, and the role of wages and alienation.

**21.175 Technology and Society** (Prereq. 21.101 or consent)

Does society control technology or is technology directing society? Has technology become dehumanized? How valid is the doctrine of technological inevitability? Can the technological "fix" be viewed as a "solution" to social problems? Is technology itself a social problem? What can be expected of "technology assessment"? What of the back-to-nature and anti-technology movements today: are they the waves of the future? These are some of the questions and issues which are discussed and analyzed. Students are expected to do considerable independent study and research.

**21.176 Science and Society**

(Prereq. 21.101 or consent) 4 Q.H.

The primary focus is on science rather than technology. Exploration of the ways in which society affects, and is in turn affected by science. The emphasis is on science as a system of thought which includes a variety of methodologies and techniques, as an occupation and profession, and as one of several institutions which engage human beings and affect the course of human history and development. Students are expected to do considerable independent study and research.

**21.200, 21.201 Group Behavior I and II (formerly Group Behavior—The Sociological Imagination)**

4 Q.H.

How individuals interact in groups and how groups interact with each other. The self as reflexive, social aspects of language, situational learning. Group perspectives, careers, institutions and social worlds.

**21.207 Seminar in Social Psychology**

(Prereq. 21.100 or consent) 4 Q.H.

Focus on the interaction of psychological and group processes. Students read original theoretical and research monographs in the field. Topics may include: prejudice, reference groups, sex roles, conformity, leadership, aggression, communication, collective behavior, and achievement.

**21.215 Collective Behavior**

(Prereq. Consent or five Soc./Anthr. courses) 4 Q.H.

The rise of new group forms in response to persistent social unrest; study of masses, crowds, and publics; analysis of specific instances of collective behavior such as race riots, wildcat strikes, prison revolts, and campus disorders.

**21.217 Mass Communication and Public Opinion**

(Prereq. Consent or four Soc./Anthr. courses) 4 Q.H.

Topics include: factors in the formation and development of public opinion, the effect of television on children, mass communication as social organization, media-depicted images of society, the role of personal influence, the process of rumor, the use of the mass media by the poor, propaganda analysis, and the latent and manifest functions of mass communication.

**21.231 Sociological Theories of Crime**

(Prereq. Consent or four Soc./Anthr. courses) 4 Q.H.

Patterns and social forces involved in criminal behavior. Analysis of sociological theories of criminality and comparison of these to other explanations of crime.

**21.236 Applied Sociology: Practice and Theory**

(Prereq. Consent or four Soc./Anthr. courses) 4 Q.H.

An analysis of the conditions under which sociological knowledge is applied to social problems, the kinds of problems, and the degree of effectiveness of this application. Particular attention is paid to research and demonstration projects that derive from sociological theory.

**21.237 Social Deviance II**

(Prereq. 21.137 or consent) 4 Q.H.

An examination of the leading theories of deviance (anomie, subcultural deviance, labeling) and their principal variants; study of their assumptions, conceptions, propositions, and supportive evidence; analysis of empirical studies in each theoretical tradition.

**21.238 Social Policy and Social Intervention (formerly Social Control II)**

(Prereq. 21.100 or consent) 4 Q.H.

Study of the formation of social policies in response to social problems; analysis of policy and problem, supporters and opponents of policy change, conditions under which control agencies adopt new policies, and effects of policy change. Particular emphasis on case studies of social action and legal change.

**21.239 Introduction to Statistical Analysis**

(Prereq. 21.100 or consent) 4 Q.H.

Application to social data of the principles of measurement, probability, measures of centrality, tests of significance, and techniques of association and correlation.

- 21.240 Research Methods I** (Prereq. 21.239 or consent) 4 Q.H.  
Introduces students to the research process through an examination of the rules of evidence in empirical research and the place of values. Students learn how to design and critique types of sociological research, how to collect qualitative and quantitative data and how to sample populations.
- 21.241 Research Methods II** (Prereq. 21.240 or consent) 4 Q.H.  
Students complete the research project begun in Research Methods I, practice coding, building indexes, scaling, table construction, and are introduced to use of the computer.
- 21.242 Qualitative Research Methods** (Prereq. 21.100 or consent) 4 Q.H.  
An introduction to sociological fieldwork—methods of gathering data by extended observation and participation with people in natural settings. Students will take part in a series of observations designed to teach the basic skills of open-ended interviewing, observing, recording and analyzing data. The theoretical base will be symbolic interaction.
- 21.245 Community Analysis** (Prereq. Consent or four Soc./Anthr. courses) 4 Q.H.  
Ecological, social structure, identity, and social action aspects of human settlements. Deals with change and conflict at the community level.
- 21.246 Seminar in Urban Studies** (Prereq. 21.145 or consent) 4 Q.H.  
Interdisciplinary approaches to urban studies are compared according to problem areas and research methods. Students have the opportunity to extend previous term paper projects after exposure to social action and social systemic theoretical perspectives.
- 21.250 Political Sociology: Who Gets What** (Prereq. Consent or four Soc./Anthr. courses)  
An examination of formal political structures and informal quasi-political groups. Sociological analysis of ideology, class politics, mass movements, and the conflict of various social and economic groups as they vie for political power and influence.
- 21.255 Administration and Formal Organizations: People, Machines, and Bureaucracies** (formerly **Sociology of Formal Organizations**) 4 Q.H.  
Principles of formal organization. Theories of bureaucracy and concept of authority; communication systems and other conceptions of formal organization. Structure of work groups and their effect on the larger organization. The social content of organizations.
- 21.260 Social Stratification: Class, Status, and Power** (Prereq. Consent or four Soc./Anthr. courses) 4 Q.H.  
Theories of social inequality, concepts of social class, aspects of status and role difference, criteria for social mobility.
- 21.265 Sociology of Occupations and Professions** (Prereq. Consent or four Soc./Anthr. courses) 4 Q.H.  
The meanings of work. Division of labor and specialization. Analysis of occupational structure and patterns of recruitment, training, and career preferences. The classic professions and new trends in professionalization.
- 21.270 Class, Power and Social Change** (Prereq. Junior or Senior standing in Soc./Anthr. or consent) 4 Q.H.  
Theories of social equality and inequality as applied to the exercise of power and the growth and development of social movements and group conflict and as seen from the point of view of large-scale social change. *Required of Majors.*
- 21.280 Social Theory I** (Prereq. Three Soc./Anthr. courses) 4 Q.H.  
The development of sociology from the history of social thought. The emergence of several schools, beginning with Positivist Organicism and Conflict Theory.
- 21.281 Social Theory II** (Prereq. Three Soc./Anthr. courses) 4 Q.H.  
A seminar-lecture course in which Formalism, Social Behaviorism, Social Action Theory, and Functionalism are studied critically.
- 21.287 Senior Seminar** (Prereq. Senior standing in Soc./Anthr. or consent) 4 Q.H.  
Opportunity to analyze, from sociological perspectives, student experience in work and

voluntary service, and to develop and extend research interests related to that work or action experience.

**21.288, 21.289, 21.290, 21.291 Directed Study**

(Prereq. Junior or Senior standing in Sociology or consent) (each) 4 Q.H.  
Independent work on a chosen topic under the direction of members of the Department. Limited to qualified students with approval of Department chairperson.

**21.292 Seminar in Current Emphases in Sociology: Writing and Talking in Sociology**

(Prereq. Junior or Senior standing in Soc./Anthr. or consent) 4 Q.H.  
How these affect consumers of sociology and its future. The class will consider prevailing modes of presentation in major journals and verbal presentation in teaching, consulting, etc. Class members will submit examples of their own writing for analysis.

**21.293 Seminar in Current Emphases in Sociology**

(Prereq. Junior or Senior standing in Soc./Anthr. or consent) 4 Q.H.  
Review and discussion of selected sociological topics.

**21.295, 21.296, 21.297, 21.298 Junior-Senior Honors Program**

(each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

**93.120 An Analysis of American Racism**

4 Q.H.

A seminar in contemporary aspects of racism in America. The cycle by which racism in our institutions helps form our attitudes, and how our attitudes in turn shape our institutions, is studied and discussed. Emphasis is on the practical, day-to-day aspects of racism, rather than the theoretical and historical.

## Political Science

**22.110 Introduction to Politics**

4 Q.H.

A broad-based introduction to contemporary political science. Areas covered include: a consideration of basic concepts in political analysis (e.g., power, authority and sovereignty); the role of governmental institutions in the making of public policy; public opinion and processes of political representation; contemporary political ideologies; and the scope and methods of political science.

**22.111 Introduction to American Government**

4 Q.H.

An analysis of the American governmental and political processes, studying constitutionalism, liberties, institutions and political behavior.

**22.112 Introduction to International Relations**

4 Q.H.

The elements of international relations, including sovereignty, power, and limitations on the behavior of nation-states. Problems of peace and the making of war/peace decisions are considered.

**22.113 Introduction to Comparative Politics**

4 Q.H.

A comparative study of parliamentary democracy in Western Europe, Communist totalitarianism in the Soviet Union, China, and Eastern Europe, and variations of these governmental systems in the "Third World" countries of Asia, Africa, and the Middle East.

**22.120 Conceptual Foundations of Contemporary Political Analyses**

4 Q.H.

An introduction to the conceptual problems associated with the study of politics, including scientific method and a general overview of the various methodological perspectives including systems theory, game theory, and survey analysis as practiced by contemporary political scientists.

**22.121 Research Methods I**

(Prereq. 22.120) 4 Q.H.

An introduction to the principal quantitative methods used in political analysis, public administration, political behavior, international relations and policy sciences. Emphasis on basic statistical techniques, survey methods and SPSS programming.

**22.122 Research Methods II**

(Prereq. 22.121) 4 Q.H.

An intermediate course in quantitative analytic techniques with emphasis on practical problem solving in areas of concentration, particularly political behavior, policy sciences, public administration and international relations. Will include intermediate statistical techniques such as multivariate analysis and causal modeling, using SPSS and drawing upon machine-readable data.

**22.130 Politics and the Mass Media**

(Prereq. 22.111) 4 Q.H.

Analyzes several facets of the mass media: the role of newspapers, radio and television in public opinion formation; their use and effectiveness in political campaigns; their objectivity and/or bias in reporting "the news"; their impact on political parties and the distribution of power between Congress and the President.

**22.132 Political Behavior**

(Prereq. 22.110) 4 Q.H.

Examines selected topics in contemporary political science from a political behavior perspective. Topics covered include: political attitude formation and change, ideology, socialization, public opinion and voting behavior, political campaigning, political violence, and empirical democratic theory.

**22.133 Political Parties and Pressure Groups**

(Prereq. 22.111) 4 Q.H.

An analysis of political parties and pressure groups in the American political system, focusing on collective decision making, electoral strategy, and party responsibility.

**22.134 The American Presidency**

(Prereq. 22.111) 4 Q.H.

A multi-faceted examination of the nation's Chief Executive. The Presidential electoral process, the President's many constituencies, and the differing styles of various twentieth-century Presidents. The constitutional and extra-constitutional powers of the office are some areas that are considered.

**22.135 American Constitutional Law**

(Prereq. 22.111 and junior or senior status) 4 Q.H.

Employing excerpts of U.S. Supreme Court decisions and other reading materials, this course attempts an analysis of some of the theoretical, structural, and substantive issues inherent in and relevant to the American constitutional system.

**22.136 American Legislative Process**

(Prereq. 22.111) 4 Q.H.

A study of American national legislative structure, function and behavior.

**22.137 Civil Liberties**

(Prereq. 22.136 or 22.131 and junior or senior status) 4 Q.H.

Employing U.S. Supreme Court decisions and other reading material, this course examines the substantive and procedural guarantees of the Bill of Rights and the Fourteenth Amendment and their relationship to a liberal democratic society.

**22.139 American Ideology**

4 Q.H.

The performance of American government measured against its ideal objectives as outlined in its ideologies.

**22.141 State Government and Politics**

(Prereq. 22.111) 4 Q.H.

The structure, functions and politics of the states, analyzing their role in the Federal system, their relationships with the national government, and their component local governments.

**22.142 Introduction to Urban and Regional Planning**

4 Q.H.

The historical influences on American urban and regional planning and the contemporary institutional, theoretical and technical issues in planning.

**22.143 Urban and Metropolitan Government**

(Prereq. 22.141) 4 Q.H.

The political, structural and functional problems of an urbanizing United States, including analyses of urban, suburban, and metropolitan governmental systems and their roles in the Federal system.

**22.144 Housing and Community Development**

4 Q.H.

A review of historical metropolitan growth patterns and the influence of public policy on the development of American cities. Topics such as urban renewal, suburbanization of low and moderate income housing and new communities are discussed.

**22.145 Housing and Urban Renewal**

(Prereq. 22.111, 22.143) 4 Q.H.

The technical, budgetary, intergovernmental and social problems of housing and urban renewal.

**22.146 Practical Politics**

(Prereq. 22.111) 4 Q.H.

Designed to accentuate and treat systematically some of the problems of organizing for effective citizen action, partisan and nonpartisan, at the grass roots level. An exploration of roles in political campaigning.

**22.148 Sex Roles in American Politics (formerly Women and Politics)**

4 Q.H.

This course will explore the relationship between what is and what ought to be—and why—in the roles of women in American politics. It will examine the traditional roles of women in politics, the suffrage movement, the woman as a citizen and voter, the role of sex in achieving power and in political efficacy, and the place of women in the “new politics.” Political action to promote women’s issues and modern feminism will also be covered.

**22.151 Comparative Government**

4 Q.H.

European democratic and totalitarian forms of government. The United Kingdom, France, and West Germany.

**22.153 European Parliamentary Systems**

(Prereq. 22.113) 4 Q.H.

A comparative analysis of political culture, federal and unitary forms of government, and executive-legislative relations on the national level in England, France, and West Germany.

**22.155 European Political Parties**

(Prereq. 22.113) 4 Q.H.

Political party organization and voter behavior in England, France, and Germany with emphasis on party ideologies, strategies, campaigns and elections as well as socialization, recruitment, and participation of voters in the political process.

**22.160 The Politics of Poverty**

4 Q.H.

This course is concerned with what it calls the poverty system, i.e. how and why there is poverty, how it affects people’s lives, and how it can be eliminated. As a discussion-centered course which also uses simulations, small group work and experience-based learning, it will examine the relationships between poverty, racism and the economic, political and administrative systems. A number of alternatives will be evaluated and an opportunity will be provided for clarifying your own assumptions and feelings about poverty.

**22.168 Human Services Administration**

4 Q.H.

This course concerns the ways in which human services are provided by the political and bureaucratic systems to low income citizens. It shows how the human services professional can function in a bureaucratic setting as a human being and an agent of organizational change. It is also designed to develop knowledge of public policy analysis, human services organizations and delivery systems, and awareness of one’s own values and potential as a human service professional. It is a discussion-based course for students interested in human services.

**22.171 Law and Society**

4 Q.H.

Introduction to the theory and philosophy of law; the historical foundations of the common law; legal methods. Primarily for non-Political Science majors.

**22.173 Politics and Economic Problems**

(Prereq. 22.111 or 22.177) 4 Q.H.

A survey of the relationship between economic developments and political processes in the United States. Among the topics considered are: government planning of the economy, monopoly and government regulation, government programs to promote social welfare, and the impact of Federalism on the political-economic system.

**22.175 Current Political Issues**

4 Q.H.

An analysis of the constitutional and political background of selected contemporary public issues. Primarily for non-Political Science majors.

**22.177 American Political Process**

4 Q.H.

A general analysis of the American political system, including national, state, and metropolitan governments and their interaction. Not open to Political Science majors or anyone who has taken 22.111 (Introduction to American Government).

- 22.178 The Politics of the Criminal Justice System** (Prereq. 22.111 or 22.177) 4 Q.H.  
The criminal justice system from arrest by police to appeal to the Supreme Court of the United States. The roles of police, lawyers, judges, prosecutors, juries, and correction officers will be examined.
- 22.179 World Politics** 4 Q.H.  
An analysis of the behavior of nations in international society, with emphasis on major current developments. Not open to Political Science majors or anyone who has taken 22.112 (Introduction to International Relations).
- 22.220 The Politics of Imperialism** (Prereq. 22.112) 4 Q.H.  
The political dynamics of penetration of foreign economies and foreign politics, considering such elements as military intervention, foreign aid, and the impact of the multi-national corporations.
- 22.221 International Relations** 4 Q.H.  
Elements and limitations of national power, contemporary world politics, problem of peace.
- 22.223 American Foreign Policy** (Prereq. 22.111) 4 Q.H.  
Formulation and conduct of foreign policy; role of the United States in politics since 1945.
- 22.224 United States—Far Eastern Relations** 4 Q.H.  
Diplomacy of the United States concerning the Far East, with both Asian and non-Asian governments. Emphasis on the American role in the evolution of the Far Eastern power distribution from World War II to the present.
- 22.225 Soviet Government** (Prereq. 22.113) 4 Q.H.  
A study of Soviet political origins and behavior, with emphasis on recent changes in the party and state apparatus, the economy, and the administration of justice.
- 22.226 Soviet Foreign Policy** (Prereq. 22.113) 4 Q.H.  
The evolution of Soviet foreign policy since 1917, with emphasis on the development of international Communist movement and the onset of the East-West ideological conflict.
- 22.227 Communism in Eastern Europe** (Prereq. 22.113) 4 Q.H.  
The Communist governments of Eastern Europe, with emphasis on their growing independence from Soviet Russia. Recent political change, economic liberalization, and new orientation in foreign policy.
- 22.228 Government and Politics in Africa** (Prereq. 22.113) 4 Q.H.  
The governmental systems, political parties, socioeconomic problems, and foreign policies of selected states north and south of the Sahara.
- 22.229 Government and Politics in North Africa** (Prereq. 22.113) 4 Q.H.  
A comparative analysis of the colonial experience, nationalism, and contemporary governmental and political organization and behavior in the Maghreb (Morocco, Algeria, Tunisia), Libya, Egypt, and the Sudan.
- 22.230 Government and Politics in Sub-Saharan Africa** (Prereq. 22.113) 4 Q.H.  
A comparative analysis of the colonial experience, and contemporary governmental and political organization and behavior in selected states south of the Sahara.
- 22.231 International Organization** (Prereq. 22.112) 4 Q.H.  
Development of international organization, with special emphasis on the United Nations system.
- 22.233 International Law** (Prereq. 22.112) 4 Q.H.  
Territory and jurisdiction of states, treaties, recognition, peaceful settlement of disputes, resort to force.
- 22.238 Ethnic Conflict in International Perspective** 4 Q.H.  
A comparative study of ethnic conflict, with its religious, linguistic, racial and economic roots in such places as Nigeria, Cyprus, Canada, Northern Ireland, Belgium and the United States. World order implications and Great Power consequences of such confrontations will also be studied.

**22.240 Totalitarianism and Dictatorship**

(Prereq. 22.113) 4 Q.H.

An analysis of totalitarianism, dictatorship, and autocracy, including study of historical background, characteristics, theories of origin, nature, and significance, evaluation of techniques, ideologies (i.e., Marxism-Leninism), policies, and institutions. Particular attention is given to Soviet and German experience.

**22.242 The Politics of Revolution and Change**

(Prereq. 22.113) 4 Q.H.

An analysis of revolution and change, contemporary and historical, with attention to both theory and practice. Topics discussed include major trends in contemporary politics and society, and the relationship between political change and technological, scientific, or social change.

**22.243 Government and Politics of Communist China** (Prereq. 22.112 or 22.113) 4 Q.H.

Government and party organization, socioeconomic problems and policies, and foreign relations of Communist China. Attention is given to the influence of history and ideology as determinants of attitudes and behavior.

**22.244 China's Foreign Relations**

(Prereq. 22.112 or 22.113) 4 Q.H.

Examines China's traditional view of international relations and how this view was modified first by contact with the West and later by Marxism-Leninism. It investigates China's role in changing the international system to accord more with her perspectives on sovereignty and equality, and the principles of socialist internationalism.

**22.245 The Politics and Policies of Developing Nations**

(Prereq. 22.112 or 22.113) 4 Q.H.

A survey of recent political and related change among third-world countries of Africa, Latin America, and Asia. Topics included are: the heritage of colonialism and achievement of independence, the realities of cultural pluralism, revolution and political violence, institution building, political leadership and role of ideology, political parties, the military in politics, and the international aspects of political modernization.

**22.247 Government and Politics of Latin America**

(Prereq. 22.112 or 22.113) 4 Q.H.

The governmental systems, political parties, socioeconomic problems, and foreign policies of Latin American states.

**22.250 Government and Politics of Japan**

(Prereq. 22.112 or 22.113) 4 Q.H.

Examines Japan's political development from the Meiji Restoration to the present. It explores the unique form of democratic government practiced in Japan and evaluates the effect of Japanese political theory, war, the American occupation, the Emperor and Japanese political and cultural values on Japan's political institutions. Japan's present and future impact on the international system are also considered.

**22.255 International Relations in Asia**

(Prereq. 22.112 or 22.113) 4 Q.H.

Examines power rivalries and political and economic interaction among East Asian states. It deals with the impact of Japan and China on their Asian neighbors, and the effect of American interests and involvement on Asia.

**22.257 Governments and Politics in the Middle East** (Prereq. 22.112 or 22.113) 4 Q.H.

A study of the governmental structures, problems, and international relations of the states of the Middle East.

**22.259 Political Development in Revolutionary Societies**

(Prereq. 22.112 or 22.113) 4 Q.H.

Examination of political development in selected revolutionary societies, including Cuba.

**22.260 Public Policy Analysis**

(Prereq. 22.111) 4 Q.H.

An analysis and evaluation of public policy in the United States.

**22.261 Public Administration**

(Prereq. 22.111) 4 Q.H.

Introduction to the theory and practice of public administration, with special emphasis on the generalities of institutions, processes, and behavior of bureaucratic organizations.

**22.262 Organization Theory**

4 Q.H.

This is a course about people and organizations, people in organized society, and how we



cope with our problems, the organizations and each other. We will discuss some basic theories of organization, but will focus on organizational and societal problems as a way of understanding how we can survive in a bureaucratic system. Such issues will include: workers, citizen participation, technology, and the problems of rich and poor nations in an interdependent world. It is a discussion course designed to introduce you to theories and ideas, and to help you develop an interest in and perspective on public administration.

**22.263 Public Management** (Prereq. 22.261) 4 Q.H.

What problems are entailed in the management of public agencies? How do public managers seek to solve these problems? These questions will be explored through the use of descriptive, analytical and case materials.

**22.264 Administrative Law** (Prereq. 22.261) 4 Q.H.

Rule-making, adjudication (formal and informal), administrative finality, judicial review, administrative procedure, scope of administrative powers, enforcement techniques, labor law, and collective bargaining.

**22.265 The Politics of Education** (Prereq. 22.111) 4 Q.H.

The political dynamics of education in America, including legislation, financial support and educational policy.

**22.226 Public Personnel Administration** (Prereq. 22.261) 4 Q.H.

The basic elements of personnel administration including recruitment, training, classification, promotion, and executive development. Special attention will be given to current problems such as equal opportunity, public employee unionism and collective bargaining.

**22.267 Public Budgeting** (Prereq. 22.261) 4 Q.H.

The politics, procedures and goals of government budgeting at the Federal, state and local levels. Aspects to be studied include expense budgeting, capital budgeting and programmed budgeting.

**22.269 Governmental Accounting** (Prereq. 22.261) 4 Q.H.

Basic accounting principles and methods as used by government agencies. Included will be the utilization and interpretation of financial statements, auditing and the application of electronic data processing in government record-keeping.

**22.270 Political Theory** (Prereq. Junior status or consent) 4 Q.H.

An analytic approach to the study of key political concepts: e.g., power, stability, equality, freedom, authority, obligation.

**22.272 Selected Issues in Political Theory** (Prereq. 22.271) 4 Q.H.

Intensive examination of some dominant issues in modern political theory.

**22.273 Political Thought I** (Prereq. Junior status or consent) 4 Q.H.

An analytical and historical examination of the great political thinkers and the main ideas in political thought from the Renaissance.

**22.274 Political Thought II** (Prereq. 22.273) 4 Q.H.

An analytical and historical examination of the great political thinkers and the main ideas in political thought from the Renaissance to the twentieth century.

**22.276 American Political Thought** (Prereq. 23.211) 4 Q.H.

The contributions to political theory of the main social, economic, political, intellectual, and philosophic movements in America from the colonial period to the present.

**22.278 Contemporary Political Thought** (Prereq. 22.101) 4 Q.H.

Analysis of current ideals, ideologies, and political movements, including Existentialism, Neo-Marxism, Black Power, Women's Liberation. The decline of ideology and behavioralism.

**22.282 Seminar in American Government**

(Prereq. Senior Political Science major and consent) 4 Q.H.

A study in depth of selected topics in American government.

**22.283 Seminar in International Relations**

(Prereq. Senior Political Science major and consent) 4 Q.H.

A study in depth of selected topics in international relations.

**22.284 Seminar in Comparative Politics**

(Prereq. Senior Political Science major and consent) 4 Q.H.

A study in depth of selected topics in comparative politics

**22.285 Senior Seminar in Political Science**

(Prereq. Senior Political Science major) 4 Q.H.

A study in depth of selected topics in political science.

**22.286 Research Seminar in Political Science**

4 Q.H.

The preparation of a research paper.

**22.287 The Politics of Poverty**

4 Q.H.

An intensive examination of political, social, economic and legal approaches to poverty and the poor in America. The course will focus on four principal strategies for dealing with poverty: 1. rights for the poor, 2. equality of opportunity, 3. redistribution of income, and 4. rejection of material values.

**22.288 Seminar in Public Law and Social Issues**

(Prereq. Junior or senior and consent) 4 Q.H.

Examines some of the continuing and perplexing social problems through the medium of legal writings and recent court cases. Issues to be discussed include abortion, euthanasia, family planning criticism of public officials, political activism, the right of privacy, obscenity, racial and economic discrimination.

**22.290, 22.291, 22.292, 22.293 Directed Study**

(each) 4 Q.H.

Independent work under the direction of members of the Department on a chosen topic. Limited to qualified Seniors majoring in Political Science, with approval of Department.

**22.295, 22.296, 22.297, 22.298 Junior-Senior Honors Program**

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## History

**23.101 Western Civilization**

4 Q.H.

The major ideas and institutions of Western Civilization from ancient times to 1648.

**23.102 Western Civilization**

4 Q.H.

A continuation of 23.101, covering the period since 1648.

**23.109 Population in European History (Group A or B)**

4 Q.H.

An application of the principles of demography to European history from Roman times to the present, with attention to the interaction of birth, death, marriage, and migration rates with climate change, epidemic disease, war, economic developments, social upheaval, and political policy.

**23.111 Ancient Greece (Group A)**

4 Q.H.

The origins and development of Greek civilization; political evolution of Hellenistic society from tribal to city-state organization; growth and application of Greek religious, political, and ethical ideas.

**23.112 Ancient Rome (Group A)**

4 Q.H.

Roman civilization in two sequences: 1. the rise of Roman power under the Republic, and 2. the decline of Roman power under the Empire.

**23.115 Medieval Europe (Group A)**

4 Q.H.

Europe from the Barbarian Invasions to the late thirteenth century; the expansion of Christianity and the institutionalization of church and papacy; the emergence of the Holy Roman Empire, England, and France as political units; social, cultural, and economic developments.

**23.116 Europe in the Age of the Renaissance (Group A)**

4 Q.H.

Europe from 1300 to 1500, when alternatives to medieval institutions became increasingly

apparent. Special attention to political, economic, and cultural changes in Italy and Northern Europe.

**23.119 Europe in the Age of Reformation (Group A)** 4 Q.H.

Political, economic, social, and religious background of the Protestant and Catholic Reformations from 1500 to 1660. Emphasis also on the impact of the Reformation on Europe.

**23.120 Europe in the Age of Reason (Group B)** 4 Q.H.

A survey of European history from 1660 to 1815, a time of great ferment climaxed by the French Revolution and Napoleon.

**23.121 19th-Century Europe (Group B)** 4 Q.H.

Europe during a century of dramatic transformation: the Industrial Revolution, the post-Napoleonic reaction; liberalism, socialism, nationalism, and imperialism.

**23.122 Europe, 1870–1921 (Group B)** 4 Q.H.

Europe from the Franco-Prussian War to the post-World War I settlement; the growing tensions and rivalries and declining certainties of the end of the nineteenth century, the origins of World War I, the War itself, the Russian Revolution, and the Peace of Paris. (Not open to students who intend to receive credit for 23.135.)

**23.123 Europe Since 1921 (Group B)** 4 Q.H.

Europe from the Versailles Settlement: the rise of totalitarianism, the Depression, the crises of liberalism and of the European mind, the Appeasement Era, World War II, the Cold War, the end of colonialism, and Europe today. (Not open to students who have received credit for 23.125.)

**23.124 Early Modern France (Group A)** 4 Q.H.

Intensive study of the political, economic, social, and intellectual development of France from the end of the Hundred Years' War through the reign of Louis XIV.

**23.127 The French Revolution and Napoleon (Group B)** 4 Q.H.

The history of France in the age of the *ancien regime* and the Enlightenment as background for the French Revolution and Napoleon.

**23.128 Modern France (Group B)** 4 Q.H.

A survey of the chief political, social, economic, intellectual, and cultural developments of France from the Revolution to the present.

**23.129 Modern Germany (Group B)** 4 Q.H.

A survey of German political, economic, social and cultural history since 1815.

**23.130 England to 1688 (Group A)** 4 Q.H.

Prehistoric Britain, the Anglo-Saxons, the Normans, the Plantagenets, the Tudors, and the Stuarts, with emphasis on the development of parliamentary institutions until the Glorious Revolution.

**23.131 England Since 1688 (Group B)** 4 Q.H.

England from the Glorious Revolution to the present, with emphasis on the development of Parliament, the Industrial Revolution, nineteenth-century reaction and reform, the World Wars, and the rise of socialism.

**23.132 Elizabethan England (Group A)** 4 Q.H.

A study of the social, cultural, economic, and political developments of sixteenth century England with special emphasis on the reign of Elizabeth I.

**23.135 Victorian England (Group B)** 4 Q.H.

The economic, social, and political life of the English people during Victoria's reign.

**23.137 England Since 1900 (Group B)** 4 Q.H.

The economic, social, and political life of the English people in the twentieth century.

**23.140 Imperial Russia (Group B)** 4 Q.H.

The emergence of Russia as a recognized European power, westernization and expansion in the eighteenth century, the impact of Napoleon, reform and revolution.

- 23.141 Soviet Russia (Group B)** 4 Q.H.  
Forces molding the history of Russia since 1917, internal developments, foreign relations.
- 23.143 Ancient Middle East (Group D)** 4 Q.H.  
From the origins of civilization in Egypt and Mesopotamia to the break-up of the ancient world in the fourth century, with emphasis on religion and culture.
- 23.144 The Middle East, 315-1800 (Group D)** 4 Q.H.  
Contacts and conflicts between East and West, emphasizing the rise and flowering of Islam.
- 23.145 The Modern Middle East (Group D)** 4 Q.H.  
The Middle East since 1800, with emphasis on the background to present problems.
- 23.147 Africa Before 1850 (Group D)** 4 Q.H.  
African prehistory, the formation of premodern societies, the dynamics of Afro-European contact before 1850.
- 23.151 Modern Africa (Group D)** 4 Q.H.  
The European impact on Africa, the rise of African nationalism, the emergence of independent African states, and the background of their present problems.
- 23.153 West African History (Group D)** 4 Q.H.  
The political, economic, social, and cultural history of the people of West Africa.
- 23.154 East African History (Group D)** 4 Q.H.  
The political, economic, social, and cultural history of the people of East Africa.
- 23.160 History of Science and Technology (Group A or B)** 4 Q.H.  
An interdisciplinary survey of the development of science and technology integrating theories of the philosophy and sociology of science within an historical framework. Emphasis is placed on the environmental and ideological conditions that contribute to the birth and growth of the various sciences and to the interrelationship between these conditions and technological innovation.
- 23.166 The Creative Matrix (Group B) (formerly 23.289)** 4 Q.H.  
Seminar in European intellectual history.
- 23.170 Modern Far East (Group D)** 4 Q.H.  
The Far East from 1850 to 1945, with emphasis on China and Japan and their relations with other nations.
- 23.171 The Far East Since 1945 (Group D)** 4 Q.H.  
The Far East, especially China and Japan, since the end of World War II.
- 23.172 Recent Leaders of Asia (Group D)** 4 Q.H.  
The lives and roles of recent leaders of Japan, China, India, and other Asiatic countries.
- 23.176 European Urban History to 1850 (Group A or B)** 4 Q.H.  
A review of urban development from the Greeks through the emergence of the industrial cities of nineteenth century Europe. Individual cities like Rome, Paris, and London are given special study.
- 23.181 European Economic History to 1750 (Group A)** 4 Q.H.  
The major economic developments of Europe, including studies in agriculture, commerce, and industry.
- 23.182 Modern European Economic History (Group B)** 4 Q.H.  
Survey of the development of the Western world examined within the framework of economic theory, with attention to social and political ramifications.
- 23.184 Socialism and Revolution (Group B) (formerly 23.293 Seminar in History of Socialist Thought)** 4 Q.H.
- 23.188 History and Film** 4 Q.H.  
An exploration of various historical issues as seen through the eyes of historians and film makers. Both acted and documentary films are shown in combination with readings from a variety of source and interpretive materials.

- 23.195 Advanced Western Civilization** (Invitation of instructor of 23.101) 4 Q.H.  
Students who demonstrate mastery of 23.101 through consistently superior work may be invited to work on an individual basis with their instructor. Together they will work out projects relating to the course.
- 23.196 Advanced Western Civilization** (Invitation of instructor of 23.102) 4 Q.H.  
Similar to 23.195 in relation to 23.102.
- 23.197 Women in History (Group A or B)** 4 Q.H.  
An examination of the changing roles of women from Ancient Greece through the French Revolution.
- 23.199 The Historian's Craft** 4 Q.H.  
The ways in which the historian studies the past and the nature of historical statements. Problems considered include research techniques, changing conceptions of historical knowledge, and the relationship between the historian and the society in which he works.
- 23.200 Social Science Methodology** (formerly **Interdisciplinary Methods**) 4 Q.H.  
Introduction to social science methodology and quantitative techniques used in historical analysis.
- 23.201 Colonial America (Group C)** 4 Q.H.  
The discovery and exploration of the New World, the settlement of the English colonies on the North American mainland, their development to 1763, and the origin of their clash with England.
- 23.202 The American Revolution (Group C)** 4 Q.H.  
The coming of the American Revolution, its nature and progress, and its political, economic, and social aftermath.
- 23.210 The United States to 1877** 4 Q.H.  
The history of the American people from 1763 to 1865, with an analysis of the American Revolution and of the major political, constitutional, diplomatic, economic, and social problems of the new nation.
- 23.211 The United States since 1877** 4 Q.H.  
A continuation of the survey of American history, with discussion of the emergence of an industrial economy, an urban society, world responsibility, and expanded Federal government.
- 23.212 Topics in American History (Group C)** 4 Q.H.  
Special topics in the history of the people of the United States from 1789 to the present.
- 23.213 American Urban History (Group C)** 4 Q.H.  
The development of urban society in the United States in the nineteenth and twentieth centuries, with emphasis on the effects of immigration and industrialization upon the politics, thought, and society of American cities.
- 23.216 American Reformers and Reform Movements (Group C)** 4 Q.H.  
An analysis of American reform, especially in the nineteenth century.
- 23.218 The Civil War and Reconstruction (Group C)** 4 Q.H.  
The coming of the Civil War, its nature and progress, and the aftermath of Reconstruction.
- 23.220 The United States, 1890—1920 (Group C)** 4 Q.H.  
Populism, progressivism, World War I, and the reaction of the 1920s.
- 23.221 The United States, 1920—1945 (Group C)** 4 Q.H.  
The Depression, the New Deal, World War II, and mid-century, emphasizing the clash between liberalism and conservatism and the movement from isolationism to interventionism.
- 23.222 The United States since 1945 (Group C)** 4 Q.H.  
America's diverse responses to postwar challenges of urbanization, economic change, civil rights, and Communism.

- 23.228 American Political Parties (Group C)** 4 Q.H.  
An examination of the emergence and development of parties from the Constitution to mid-twentieth century, with attention to their support, programs, and function.
- 23.231 American Immigration (Group C)** 4 Q.H.  
An examination of immigration to the United States and its effect on American society.
- 23.233 America and the Sea (Group C)** 4 Q.H.  
The history of exploration and discovery of America; the development of fishing; the rise of ocean commerce; the history of the American Navy.
- 23.241 African-American History to 1895 (Group C)** 4 Q.H.  
The black experience in colonial America and the United States to 1895, with special emphasis on the slave trade, slavery, the ante-bellum free black, black abolitionism, and the role African-Americans played during the Civil War and Reconstruction.
- 23.242 African-American History since 1895 (Group C)** 4 Q.H.  
The black struggle against white racism from the era of accommodation to black power, emphasizing the contributions made by the major African-American leaders of the twentieth century.
- 23.244 The History of Boston (Group C)** 4 Q.H.  
The history of Boston from the colonial time to the present with attention to the topographical growth and the ethnic composition of the place.
- 23.250 American Historians (Group C)** 4 Q.H.  
The literature of American history; major American writers of American history from the colonial period to the present, with emphasis on changing form and substance.
- 23.253 American Elites (Group C)** 4 Q.H.  
The life of elite individuals and groups in American society, especially in the nineteenth and twentieth centuries.
- 23.255 American Business History** 4 Q.H.  
The rise of business in America; the role of the corporation; horizontal and vertical combinations; business and labor; business and government.
- 23.276 Latin America to 1850 (Group D)** 4 Q.H.  
The fusing of the cultures of the Indian, the Iberian, and the Negro; the European and American forces which gave rise to the Latin American wars for independence; the early development of the new nations.
- 23.277 Modern Latin America (Group D)** 4 Q.H.  
Latin America from mid-nineteenth century to the present; dictatorial republics and the continuation of poverty and injustice; the struggles toward democracy, the rise of nationalism, and the threat of Communism; the relations between the United States and Latin America.
- 23.279 Canadian History (Group D)** 4 Q.H.  
The history of Canada from earliest times to the present. Not open to students who received credit for 23.150.
- 23.280-23.285 Teaching Practicum in History**  
(Prereq. 51.200 and departmental approval) (each) 1 Q.H.  
Students who have completed 51.200 and who wish to continue to peer tutor in Western Civilization may do so by enrolling in these courses sequentially. Each course requires three hours per week of tutoring.
- 23.286 Field Work in History I**  
(Prereq. 23.101, 23.102, 23.210, 23.211 and 16 Q.H. in other history courses.) 4 Q.H.  
Directed work in historical societies, archives, museums, and other historical agencies. Students should consult the Department of History for details.
- 23.287 Field Work in History II** (Prereq. 23.286) 4 Q.H.  
Directed work in historical societies, archives, museums, and other historical agencies. Students should consult the Department of History for details.

<b>23.288 Seminar in Medieval History (Group A)</b>	4 Q.H.
<b>23.289 Seminar in European Intellectual History (Group B)</b>	4 Q.H.
Not open to students who received credit for 23.136.	
<b>23.290 Seminar in Modern European History (Group B)</b>	4 Q.H.
<b>23.291 Seminar in American History (Group C)</b>	4 Q.H.
<b>23.292 Seminar in Early Modern Europe (Group A)</b>	4 Q.H.
<b>23.295, 23.296, 23.297 Junior-Senior Honors Program</b>	(each) 4 Q.H.
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.	
<b>23.299 Directed Study</b>	4 Q.H.

## African-American Studies

### **25.050 Educational Issues for Black Americans**

(Prereq. 25.251 or consent of instructor) 4 Q.H.

Issues in alternative schools, curricula, funding, and outcomes that concern black people. These issues are researched and critically analyzed as to what effect they will have on black America. The course takes the format of a seminar, with well-known guest speaker presentations integrated with usual class presentations.

### **25.100 Science and Black Society I**

4 Q.H.

A firm foundation in science and scientific method is the groundwork for an interesting look at the implications of scientific investigations on black society. Has science really enriched the black society or has it hindered it? What are the far-reaching effects of the Tuskegee Project, the eugenetics of Jensen and Shockley, legalized abortion and the population explosion, NIH (National Institutes of Health)-granted policies, the shortage of black physicians? What has been the role of blacks in science? In short, we examine a myriad of questions to elucidate the interrelationships between science and black society.

### **25.101 Science and Black Society II**

(Prereq. 25.100 or consent of instructor) 4 Q.H.

### **25.121 Urban Seminar**

### **25.141 Elementary Swahili**

4 Q.H.

Essentials of grammar; practice in pronunciation and progressive acquisition of a basic vocabulary; idiomatic expressions.

### **25.142 Elementary Swahili**

(Prereq. 25.141) 4 Q.H.

Continuation of 25.141.

### **25.143 Intermediate Swahili**

(Prereq. 25.142) 4 Q.H.

Review of grammar, with practice in composition and conversation.

### **25.145 Elementary Arabic I**

4 Q.H.

Essentials of grammar; practice in pronunciation and progressive acquisition of a basic vocabulary; idiomatic expressions.

### **25.146 Elementary Arabic II**

(Prereq. 25.145) 4 Q.H.

Continuation of 25.145.

### **25.147 Intermediate Arabic**

(Prereq. 25.145 or consent of instructor) 4 Q.H.

Review of grammar, with practice in composition and conversation.

### **25.150 Blacks and the Media**

4 Q.H.

This course will focus on several key issues regarding mass media and African peoples; What is the nature of the mass media? Who makes all the important "controlling" decisions about the nature of the mass media communications? What is the result of current black T.V. programming upon the welfare of African peoples in American? In what ways do mass media affect the liberation of African peoples?

**25.170 Economic Problems of Black Americans**

4 Q.H.

The correlation among social, political, and economic conditions of black people in the United States.

**25.171 Poverty and Health Care**

4 Q.H.

Is there a two-class system of health care in this country; one for the rich and one for the poor? Is health care really a right or a responsibility? Is the real problem the delivery of health care, or lack of trained health personnel? We hope to begin to understand some of the problems concerning the poor and their failure to obtain good health care, examination of the entire health care system, Blue Cross and Blue Shield, Medicaid and Medicare, National Health Insurance, low income barriers to health care, and some future directions of medical health care.

**25.172 Community Medicine and Delivery of Health Care**

4 Q.H.

Provides both theoretical and practical insight into community medicine and the delivery of health care. Overview of total health care system and theoretical considerations of role of community medicine, what it should be and how it meets problems associated with the delivery of health care. Practical issues will be faced by field trips to community health centers and lectures by community health officials at all levels.

**25.180 Black Diseases**

4 Q.H.

**25.181 Black Nutritional Habits**

4 Q.H.

Chitterlings, black-eyed peas, rice and peas, plantain, arroz con pollo, all sorts of dishes mainly enjoyed by third world peoples will be examined and consumed in this nutritional course. This course will begin with a strong consideration of nutrition, energy production, chemical makeup of foods, and other basic scientific material needed to understand the science of nutrition. The emphasis will then shift to the many kinds of foods black people consume—whether in Africa, Puerto Rico, the West Indies, or Portugal. Field trips to restaurants specializing in these various foods are planned.

**25.210 Contemporary Problems in Black Society**

4 Q.H.

Study of contemporary psych-political problems. From a study of this area in its global generality should come a careful paper on problem-solving in a specific area.

**25.212 Politics of the Black Family**

4 Q.H.

Anthropological and sociological theories and concepts as they relate to the black family in Africa and the diaspora. The theories and concepts will deal with variations in family structure and function, their correlation to economic and political organization, the traditional and modern function of family in society, the effect of slavery and colonization on black family structure and function, and similarities and differences in African, African-American, and African-Caribbean families.

**25.218 The Black Man/Black Woman**

4 Q.H.

**25.221 Black Ideologies**

4 Q.H.

An evaluation of the problem-solving techniques which have been developed through black peoples' experience in recent years. This course seeks to scrutinize these techniques and/or programs. The arenas in which such programs operate are appraised carefully from a political perspective. The course objective is to redefine political science toward dealing with current realities by some of the available means. The methodology is analysis and criticism.

**25.222 Third World Political Relations**

4 Q.H.

Introductory course to theory and practice of relations among nations. Special attention will be given to relations between the have and have-not nations. Emphasis on Third World problems.

**25.223 Urban Politics**

4 Q.H.

**25.224 Urban Bureaucracy and the Black Community**

4 Q.H.

This course will focus on the urban bureaucracies and their relation to the black community. The course will be from the perspective of the client, the bureaucrat, and the community as a whole. Major emphasis will be placed on the analysis of case material, including some



material from Boston. While some theory will be presented in the lectures, the primary focus will be on cases and text material.

**25.226 Oral Traditions in African-American Experience**

4 Q.H.

The time period covered in this course will be from about 1400 to the twentieth century. The dominant theme will be the examination and study of the historical events leading to the institutionalization of slavery, slavery as it evolved in America, and the subsequent response or reactions of the black community to this condition of servitude. In addition to the examination of these events, there will be an attempt to tie in the importance of African-American oral traditions, and the use of oral history as an historiographical tool for black historians in rethinking and redefining black history.

**25.228 The Black Church**

4 Q.H.

The historical and contemporary role(s) of this important black institution will be studied in depth. What has been the function of religion in the lives of black people in the United States? Has this changed?

**25.229 Black Rhetoric and Writing Skills (formerly 25.140)**

(Prereq. 30.113 and 30.114) 4 Q.H.

Analysis and application of principles of rhetoric and study of the best ways to write effectively and persuasively. Interdisciplinary examination of principles underlying effectiveness in communication of all social sciences and academic fields related to the African-American experience.

**25.232 East Africa from the 11th Century to Present**

4 Q.H.

The general background, Portuguese period, East African societies, European impact and the independence struggle will be discussed.

**25.234 Africa Today**

4 Q.H.

Current affairs in Africa designed to enhance the student's understanding of its problems, challenges and opportunities.

**25.235 Black Aesthetics**

4 Q.H.

The black "cultural revolution" speaks to the concept of beauty as expressed through black art forms. Drama, music, poetry, prose, plays and all creative expression will be both discussed and performed by the class.

**25.240 Race, Racism and American Law**

4 Q.H.

The rapidly growing body of law attacking racial discrimination in education, housing and employment. The historical background of these fields is reviewed, but focus is on contemporary issues. Special attention is given to limits on the right to protest all forms of discrimination imposed by the courts. The alternatives to legally protected protest activities, including civil disobedience, are also reviewed.

**25.241 Civil Rights Movement**

4 Q.H.

The significance of what did and did not take place in the Civil Rights Movement of the 1960s will be studied in depth. Guest lectures from people important to the movement will sharpen our analysis.

**25.249 Minority Business Needs**

4 Q.H.

The objectives of this course are twofold: 1) to provide a prospective for analyzing general and strategic business concepts and to understand the problems of entrepreneurs; 2) to relate that prospective to the specific problems of minority enterprises. The course requires a medium reading load of two required books and selected articles from periodicals and other books.

**25.250 Foundations of Black Culture I**

4 Q.H.

An overview of the rich and varied aspects of life for all people of African descent. Study of black culture from ancient African cultures through the Civil War. This introductory course in African-American Studies is team-taught by staff in history, literature, music, drama, education, human services, philosophy, and social sciences.

**25.251 Foundations of Black Culture II**

4 Q.H.

Continuation of study of black culture from Reconstruction to the 1970s.

**25.252 Organizing Black Communities**

4 Q.H.

A seminar designed for those students whose concerns and future professional involvements might be in the urban community.

**25.254 Black Community and Social Change**

(Prereq. 25.251 or consent of instructor) 4 Q.H.

Study of those components of the black community which exercise (active or passive) social control: the black church family, ethos. What environmental factors make us what we are? What environmental controls make for change? For what kind of change?

**25.255 Policy Analysis and the Black Community** (Prereq. consent of instructor) 4 Q.H.

Designed to introduce the students to the dynamics of public policy. Emphasis will be directed toward analyzing public policy on the state, local, and federal level, particularly with regard to its implications for Third World people. Will also critique the policy maker, his role and his power in the political and social setting.

**25.256 African Civilization**

4 Q.H.

A broad introduction to the culture of the African continent, with an analysis of historical developments from pre-historic to modern times and special emphasis on the foundations of black culture and the contribution of Africa to the development of Western civilization.

**25.257 Field Seminar**

(Prereq. consent of instructor) 4 Q.H.

A practical program of carefully supervised field work designed to provide a special opportunity for career preparation. First-hand knowledge of the realities of working in a given situation are expected to begin development. This course is closely supervised by the appropriate staff member in a given area, and is intended to supplement classes and co-op in a particular area of career preparation.

**25.258 Directed Study**

(Prereq. consent of instructor) 4 Q.H.

A scholarly piece of independent research under the supervision of an instructor or professor of African-American Studies (or, by mutual consent, another Department). The student is expected to choose an academic problem of particular interest to him, in light of his career preparation, and to develop the tools to show how it might be solved.

**25.259 Directed Studies for Senior Thesis**

(Prereq. consent of instructor) 4 Q.H.

Majors in African-American Studies will work closely with an adviser in the student's area on a substantive senior thesis.

**25.260 Black Ethics**

4 Q.H.

Philosophical treatment of changes in traditional Western ethics produced by such notions as "Black Power," "The New Morality," "The New Left." Should be especially useful for students in philosophy, criminal justice and African-American studies programs.

**25.261 Seminar: W.E.B. DuBois**

4 Q.H.

The social and political thought of William Edward Burghardt DuBois. The seminar will allow for substantial discussion periods but will include lectures, guest lectures and joint classes with other area students. Readings will include *Souls of Black Folk*, *The Crisis Writings*, *The Education of Black People*, *Dusk of Dawn* and other pertinent excerpts.

**25.262 History of Black Ideas**

4 Q.H.

**25.271 History of African-American Art**

4 Q.H.

**25.281 Black Music as a Domestic and International Phenomenon**

4 Q.H.

History of jazz from standpoint of the black artist of today and of the past. Approached chronologically, touching on such topics as African music, the New Orleans coalescence, regional developments, ragtime, the emergence of large bands, the harmonic revolution of the 40s, bebop, the 1960s *avant garde* and subsequent development. Analysis of specific jazz phenomena. Broad sampling of African-American music and insight into the working tools of black musicians.

**25.295, 25.296, 25.297, 25.298 Junior-Senior Honors Program**

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

*The following courses may also be of interest to the student wishing to concentrate in African-American Studies. Descriptions for these courses may be found in the appropriate departmental listing.*

<b>21.145</b>	Urban Society
<b>21.150</b>	Race and Cultural Relations
<b>21.270</b>	Social Change
<b>20.250</b>	Political Anthropology
<b>20.255</b>	Economic Anthropology
<b>20.259</b>	Urban Anthropology
<b>22.132</b>	Political Behavior
<b>22.133</b>	Political Parties and Pressure Groups
<b>22.137</b>	Civil Liberties
<b>22.171</b>	Law and Society
<b>22.228</b>	Government and Politics in Africa
<b>22.229</b>	Government and Politics in North Africa
<b>22.233</b>	International Law
<b>22.242</b>	The Politics of Revolution and Change
<b>22.245</b>	The Politics and Policies of Developing Nations
<b>22.270</b>	Political Theory
<b>22.278</b>	Contemporary Political Thought
<b>23.241</b>	*African-American History I
<b>23.242</b>	*African-American History II
<b>23.153</b>	West African History
<b>26.101</b>	Introduction to Philosophy I
<b>26.102</b>	Introduction to Philosophy II
<b>26.155</b>	Moral Philosophy
<b>26.120</b>	Existentialism
<b>26.131</b>	Social Philosophy
<b>30.253</b>	Seminar: Wright/Ellison/Baldwin
<b>30.267</b>	*African-American Literature I
<b>30.268</b>	*African-American Literature II
<b>30.269</b>	The Black Novel
<b>30.276</b>	African Literature

*\*Required for majors*

## Philosophy

**26.101, 26.102 Introduction to Philosophy I and II** (each) 4 Q.H.

An examination of some of the central and persistent issues in philosophy. These courses are independent and may be taken in reverse order. Both emphasize philosophical thinking as an activity rather than the assimilation of an established body of facts. 26.101 includes such topics as theories of reality, theories of knowledge, and philosophical problems in religion. 26.102 includes such topics as social and political philosophy and philosophies of art and history.

**26.103 Introduction to Religion** (formerly 26.183) 4 Q.H.

Seeks to identify and appraise different ways of being religious: primitive, mystical, dogmatic, and ritual. Emphasis will be placed upon appreciating the unique standpoint that each "way of being religious" requires, how each sees the world in a radically different way, and how that leads to distinctive ways of life.

**26.104 Understanding Religious Man** (formerly 26.177) 4 Q.H.

Several important explanations of the nature, origin, and present significance of religious experience, beliefs, and practices in the light of modern knowledge and attitudes.

**26.105 Introduction to Scientific Method**

4 Q.H.

Changing conceptions of scientific method from the Renaissance to the twentieth century. The role of mathematics and experiment in the work of Copernicus, Galileo, Descartes, Newton, and Einstein.

**26.110 Classical Greek Philosophy**

4 Q.H.

From early Greek philosophy before the time of Socrates to Aristotle. Emphasis upon the thought and influence of Socrates, Plato, and Aristotle.

**26.111 Modern Philosophy**

4 Q.H.

European philosophy from the renaissance to the nineteenth-century; emphasis upon Francis Bacon, Descartes, Spinoza, Locke, Berkeley, Hume, and Kant.

**26.117 19th-Century Philosophy**

(Prereq. 26.110 and 26.111 or consent of instructor) 4 Q.H.

Selected trends in this century, such as the development of German idealism, romanticism, evolutionism, materialism, and positivism. Hegel, Schopenhauer, Nietzsche, Kierkegaard, and Marx are representative.

**26.118 20th-Century Philosophy**

(Prereq. 26.110 and 26.111 or consent of instructor) 4 Q.H.

Contemporary philosophic movements in metaphysics and methodology exemplified by process philosophy, linguistic analysis, pragmatism, phenomenology, and existentialism.

**26.119 American Philosophy**

(Prereq. 4 Q.H. philosophy or consent of instructor) 4 Q.H.

Background to American philosophy: Locke, Newton, Edwards, and Colder. The American Enlightenment: Jefferson, Paine, and Rush. Pragmatism: Peirce, James, Dewey, and Meade. Realism: Perry and Sellars. All of the above are dealt with in this course.

**26.120 Existentialism**

(Prereq. 4 Q.H. philosophy or consent of instructor) 4 Q.H.

Existentialist philosophy (Kierkegaard, Nietzsche, Dostoevski, Heidegger, Jaspers, Sartre, Camus) examined in relation to contemporary human sciences, psychology, and psychoanalysis. Special attention devoted to theories on man and self-alienation.

**26.121 Analytic Philosophy** (Prereq. 8 Q.H. philosophy or consent of instructor) 4 Q.H.

The development of the analytic movement from its beginnings in the early works of Moore and Russell. Some treatment of Russell's logical atomism, the logical positivists, the thought of Ludwig Wittgenstein, and their widespread influence.

**26.125 Philosophy of Mind**

(Prereq. 4 Q.H. philosophy or psychology or consent)

The traditional problems concerning mind/body dualism and philosophical reactions to it as well as more contemporary problems in the philosophy of psychology. Special emphasis will be placed upon the notions of *mental* and *physical* phenomena, their interrelations and the philosophical problems associated with *behaviorism* and the concept of the *unconscious* in psychology.

**26.126 Philosophical Problems of Law and Justice**

4 Q.H.

A consideration of philosophical issues concerning the law and its enforcement. The focus will be on such areas as the nature of law, the enforcement of morality, the limits on legal interference with individuals, the justification of punishment, alternatives to punishment.

**26.130 Aesthetics**

4 Q.H.

An analysis of the nature and meaning of aesthetic experience and the principles of art criticism. The possibility of standards in art and the relation of art to ethics, society, and religion are discussed.

**26.131 Social and Political Philosophy**

(Prereq. 4 Q.H. philosophy or consent of instructor)

Philosophic theories on man and society, social change and institutions. Readings from Plato, Aristotle, Machiavelli, Locke, Rousseau, American eighteenth century, Hegel, Marx, Sartre, Camus, Marcuse, Fanon, Mao, Niebuhr, Hook. Major attention will be given to twentieth century social theories.

**26.133 Philosophy of Science**

(Prereq. 8 Q.H. natural or social science)

Analysis of distinguishing characteristics of the scientific enterprise; the role of theory, observation, and experiment; significance of paradigms to claims of objectivity; effects of differing methodology on content; and problems about the relation between various sciences.

**26.134 Philosophy of Religion**

(Prereq. 4 Q.H. religion or consent of instructor)

An examination of such topics as the existence of God derived from reflection of nature and experience, and the logical status of religious belief and faith in a rational person.

**26.135 Philosophy of Human Nature**

4 Q.H.

A philosophical inquiry into theories and characteristics of man and his nature, with special interest in conceptions of alienation. Selected readings include Socrates, Plato, Descartes, Hobbes, Hegel, Marx, Kierkegaard, Heidegger, Freud, Jung, Sartre, Maritain, Fromm, Marcuse, and Frankl.

**26.137 Philosophy and Literature**

4 Q.H.

Analysis of basic philosophic themes expressed in such writers as Tolstoy, Dostoevski, Thomas Mann, Sartre, Camus, Kafka, Hesse, Bellow, and others.

**26.143 Vonnegut as Philosopher**

4 Q.H.

Philosophical themes in the work and thought of Kurt Vonnegut, Jr. His novel view of human society and its relationship to art, technology, and history will provide a general background. Within this, his treatment of the meaning of life, the nature of a person, the mysteries of language and the possibility of time-travel will be discussed. Vonnegut's novels and other materials will be used.

**26.145 Technology, Human Freedom, and Dignity**

4 Q.H.

The tensions between humanism, its values and beliefs and the accelerating changes of a modern technological society. Such issues as the relation of technology to human freedom and privacy; the effects of "future shock" upon the individual; the possibility of the tyranny of a technological elite; and the future prospects for humanity are explored.

**26.148 Meaning of Life**

4 Q.H.

Philosophical inquiry into man's existence in contemporary world and conceptions of man's search for identity and fulfillment. Selected problems from existentialist philosophy and psychology: freedom, death, human sexuality, alienation, unauthenticity, authenticity, becoming a person, peak experiences. Selections from Kierkegaard, Heidegger, Sartre, Camus, Merleau-Ponty, Allport, Frankl, Rogers, May.

**26.150 Introduction to Logic**

4 Q.H.

Recognition of common fallacies, practical exercises in effective argument, formal principles of correct and incorrect reasoning; entails traditional, deductive logic. Included are formal and informal fallacies.

**26.151 Symbolic Logic**

4 Q.H.

Presentation of first-order deductive logic. Analysis of the notion of proof and techniques for constructing proofs. The theory of identity, and results on consistency, completeness, and decidability will be presented.

**26.152 Theory of Knowledge (formerly Epistemology)**

(Prereq. 4 Q.H. philosophy or consent of instructor)

Major theories, problems and concepts in the theory of knowledge: problems of scepticism and the justification of beliefs; the nature of knowledge and truth; relation of reason and experience to knowledge.

**26.153 Metaphysics**

4 Q.H.

A consideration of central problems and theories concerning the nature of reality, with special attention to such areas as the relation between mind and matter, free will and determinism, and criteria of existence.

**26.154 Contemporary Moral Issues**

(Prereq. 4 Q.H. philosophy or consent) 4 Q.H.

Will focus on a variety of concrete moral controversies in current society, and an attempt will

be made to clarify and resolve them. Issues to be discussed include such things as abortion, euthanasia, capital punishment, war, censorship, and population control.

**26.155 Moral Philosophy (formerly Ethics)**

(Prereq. 4 Q.H. philosophy or religion, or consent of instructor) 4 Q.H.

Topics in philosophical ethics: the nature and basis of value judgments, the concepts of justice, human rights, punishment, moral obligation and goodness. Ethical relativity, utilitarianism, deontology and emotivism are the chief meta-ethical theories considered.

**26.160 Introduction to Inductive Logic**

(Prereq. 26.150) 4 Q.H.

Survey of techniques for weighing evidence and justifying predictions. The theory of probability and principles of probabilistic inference applied in scientific contexts and ordinary life. The problem of rationally justifying such techniques. (This course continues 26.150.)

**26.171 Hinduism and Buddhism (formerly Oriental Religions)**

4 Q.H.

Description and interpretation of the major Indian traditions which will attempt to establish their fundamental characteristics. Attention will be given to the development of Mahayana Buddhism in Tibet, China, and Japan; and to the ways of knowledge, devotion, duty, and meditation in the Hindu tradition.

**26.174 Christian Faith and the Problem of Interpretation**

4 Q.H.

An examination of twentieth-century attempts at understanding the meaning of Christian faith. Beginning with some of the classical approaches to New Testament interpretation, the study concentrates on issues raised by Albert Schweitzer's "Quest of the Historical Jesus," Rudolph Bultmann's "Demythologizing," and the problem of the new hermeneutics.

**26.175 Faith and Tradition in India**

4 Q.H.

An examination of selected historical, philosophical, and theological elements of Indian tradition, with special emphasis on post-Buddhist periods. The influence of Indian thought in the Far East is examined, as well as the influence of British Western civilization on Indian culture.

**26.178 Religion in a Social Context**

4 Q.H.

An exploration of the social forms of religion. The structures and roles of the church, synagogue, and sect are described and critically evaluated. In addition, emphasis is given to their function, with reference to general social structure, process, and reform.

**26.180 Myths and Dreams as Religious Experience**

4 Q.H.

An inquiry into the basic dimensions of religious experience as illuminated by myths and dreams. A reading of myths from both Eastern and Western cultures to elucidate the world pictures they create. An attempt is made to identify the questions of man and world to which these myths respond.

**26.181 Paradigms for Religious Experience**

4 Q.H.

A study of selected spiritual leaders and founders of religion such as Buddha, Socrates, Confucius, and Jesus, the unique dimensions of whose life and teachings provide paradigms for religious experience. It is an attempt to identify the concrete meaning of religious experience, to discover the means of communicating faith, and to describe the relations as well as differences between the "teacher" and "saviour."

**26.182 Religion in the Age of Science**

4 Q.H.

An examination of the problems posed by the interaction between religion and the natural and social sciences. Representative selections from Hume, Darwin, Marx, Freud, Erickson, and Troeltsch are used to interact with selections from Bultmann, Teilhard de Chardin, Niebuhr, Bonhoeffer, and Tillich.

**26.184 Freud, Jung, and Religion**

4 Q.H.

The psychologies and theories of religion of Freud and Jung and their views on the nature of symbolic systems and cultural symbols. The course attempts to answer such questions as: Is religion a socially formalized and justified neurosis? Is it social therapy? Are religious symbols throwbacks to childhood or are they the means by which we can finally reach enlightenment?

**26.185 Atheism: East and West**

4 Q.H.

A survey of some of the major approaches to the question of the meaning of life that deny or ignore God. Ancient China as a godless but religious culture is emphasized in the first part of the course. This emphasis includes Taoism, Buddhism, and Confucianism. The relatively stable world-view of Ancient China is compared and contrasted with the vying godless world-views of the West, including Marxism and other secular humanisms.

**26.187 The Meaning of Death**

4 Q.H.

A broad, interdisciplinary approach to the phenomenon of death: including reports from individuals facing their own death or that of someone close to them; what psychologists and sociologists say about the anxieties, conflicts, and insights produced by the experience; what philosophers say about life as a process leading toward death; and what religious myths and doctrines of death and the afterlife have contributed to mankind.

**26.188 The Occult as Religion**

4 Q.H.

The history, aims, and method of such esoteric or mystic doctrines as astrology, numerology, magic, demonism, and divination. Investigates the structural similarities of these religious forms to those of the dominant religious traditions of the world.

**26.203 Existential Phenomenology** (Prereq. 4 Q.H. philosophy or consent of instructor)

Husserl's phenomenological method as an inspiration for contemporary existential psychology and existential psychoanalysis. Works of Sartre, Merleau-Ponty, Laing, Frankl examined in contrast and conflict with psychological theories of Freud, Sullivan, Horney, Fromm, Maslow, Koestler, and Skinner. Students will be encouraged to bring in their own academic background to bear on theoretical aspects of areas dealt with.

**26.261 Seminar in Plato**

(Prereq. 8 Q.H. philosophy or consent of instructor)

**26.262 Seminar in Aristotle**

(Prereq. 8 Q.H. philosophy or consent of instructor)

**26.274 Seminar in Judaism** (Prereq. 8 Q.H. philosophy or consent of instructor) 4 Q.H.

**26.275 Contemporary Religious Issues in the Western World**

(Prereq. 26.174 or consent of instructor) 4 Q.H.

An analysis of some major developments in Christianity and Judaism in the context of industrialization and urbanization. An exploration of the impact of secularism upon the religions of the West as evident in Neo-Orthodoxy, Bonhoeffer's "Religionless Christianity," the radical theology of the death of God, and the trends toward a new humanism.

**26.276 Mysticism: East and West**

(Prereq. 26.177, 26.180, or consent of instructor) 4 Q.H.

An inquiry into mystical experience through a comparative study of the writings of Christian, Buddhist, and Hindu mystics, and secondary interpretive sources. Areas taken up are: the potential oneness of man and God, the conflict of mystics with traditional forms of religion, and the possibility of a common cross-cultural basis for mysticism.

**26.279 Issues in Contemporary Islam**

(Prereq. 26.177, 26.180, or consent of instructor) 4 Q.H.

A discussion of such issues in twentieth-century Islam as: Pan-Islamic movements; relations with Israel and the West; the Qu'ran as lawbook; social change in modern Islamic countries through Western influence; variation on the theme of Islam in Africa, Turkey, and Iran; and the Muslim view of history.

**26.290, 26.291 Directed Study**

(each) 4 Q.H.

Students interested in department-directed studies should discuss their interests with the department chairperson.

**26.295, 26.296, 26.297, 26.298 Junior-Senior Honors Program**

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Art

- 27.113 Creative Drawing** 4 Q.H.  
Creative drawing in pen and ink, pencil, and crayon, with emphasis on form and texture.
- 27.114 Theory of Color and Design** 4 Q.H.  
Techniques and theories of design and color in painting.
- 27.115 Basic Painting** 4 Q.H.  
Practice and creative expression in the basic techniques of painting, including study of color, space and form.
- 27.116 History of Film Art I** 4 Q.H.  
A history of the development of film art from the late nineteenth century to the 1930s. Selected films are screened and studied. Lab fee.
- 27.117 History of Film Art II** 4 Q.H.  
A history of the development of film art from the 1930s to the present. Selected films are screened and studied. Lab fee.
- 27.118 History of Art I** 4 Q.H.  
A survey of Western art from prehistoric times to the Renaissance.
- 27.119 History of Art II** 4 Q.H.  
A survey of Western art from the Renaissance to the twentieth century.
- 27.120 French Film** 4 Q.H.  
A survey of French film making from the late nineteenth century to the present. Selected films are screened and studied. Lab fee.
- 27.121 Contemporary Directions in Cinema** 4 Q.H.  
A comparative study of selected films by major contemporary directors. Films are screened and studied. Lab fee.
- 27.131 Ancient Art** 4 Q.H.  
A concentrated study of art from prehistoric times to Greek civilization, including Egyptian, Mesopotamian, and Aegean art.
- 27.136 Classical Art** 4 Q.H.  
A concentrated study of Greek and Roman art.
- 27.137 19th-Century Painting** 4 Q.H.  
European painting of the nineteenth century, with special emphasis on romanticism, realism, and impressionism.
- 27.139 Medieval Painting and Sculpture** 4 Q.H.  
Romanesque and Gothic painting and sculpture from the tenth to the fifteenth centuries.
- 27.143 Mexican Art** 4 Q.H.  
A concentrated study of Pre-Columbian art from the Archaic and Classical periods to the present.
- 27.144 Latin American Art** 4 Q.H.  
The arts of architecture, sculpture, and painting of various countries of Latin America except Mexico, from Pre-Columbian times to the twentieth century.
- 27.148 European Graphic Arts** 4 Q.H.  
The history of graphic arts from the medieval period to the end of the nineteenth century. The development of engraving, woodcutting, etching, aquatint, and lithography and the work of representative artists.
- 27.149 American Graphic Arts** 4 Q.H.  
Development of the graphic arts in America from the colonial times to the present as shown through the works of representative artists.
- 27.150 History of Photography** 4 Q.H.  
A concentrated study of the development of photography, with special emphasis on American photographic art to the present.



- 27.151 Modern Painting** 4 Q.H.  
Painting from the late nineteenth century to the present.
- 27.152 Introduction to Art** 4 Q.H.  
A basic course in the characteristics of style, media, and techniques of painting, sculpture, graphic arts, architecture, and film art. Serves as a foundation for future study in art history.
- 27.161 American Art I** 4 Q.H.  
Development of American architecture, sculpture and painting from colonial times.
- 27.162 American Art II** 4 Q.H.  
American architecture, sculpture and painting from 1860 to the present.
- 27.171 Ancient Architecture** 4 Q.H.  
The architecture of Egypt, Greece, and Rome.
- 27.172 Medieval and Renaissance Architecture** 4 Q.H.  
Romanesque, Gothic, and Renaissance architecture.
- 27.173 Modern Architecture I** 4 Q.H.  
A study of architecture and city planning from 1850 to 1920.
- 27.174 Modern Architecture II** 4 Q.H.  
The great figures and the chief movements of twentieth century architecture and city planning.
- 27.175 Late 19th-Century American Architecture** 4 Q.H.  
A survey of the Stick and Shingle Architectural Styles, as well as more general developments. Introductory lectures are followed by student presentations on selected topics.
- 27.176 Contemporary Architecture** 4 Q.H.  
Architecture and city planning since World War II, with special emphasis on their forms, theories, and social implications.
- 27.177 Introduction to Architecture** 4 Q.H.  
A survey of the stylistic characteristics of architecture from ancient periods to the present.
- 27.181 Oriental Art I** 4 Q.H.  
The prehistoric arts of India, China, and Japan; the rise and spread of international Buddhist art; the national Indian styles of sculpture, architecture, and painting.
- 27.182 Oriental Art II** 4 Q.H.  
National styles of painting, sculpture, architecture, ceramics, and printmaking in China, Korea, and Japan.
- 27.183 Seminar in Modern Art and Architecture** 4 Q.H.  
(Prereq. One course in art history since the Renaissance)  
Selected topics in modern art and architecture.
- 27.184 Graphic Arts I-Woodcutting** 4 Q.H.  
Creative print making utilizing the media of woodcutting.
- 27.185 Graphic Arts II-Silkscreen** 4 Q.H.  
Creative print making utilizing the media of silkscreen.
- 27.186 Documentary Film** 4 Q.H.  
Study of the aesthetics and tradition of the documentary film, with a major emphasis on contemporary directions.
- 27.189 Photography** 4 Q.H.  
Introduction to theory, practice, and techniques of photography. Emphasis on aesthetics, creative, technical, professional, and commercial aspects of making a photographic image. Lab fee.
- 27.190 Film Making** 4 Q.H.  
Introductory course in the techniques of film making. Students produce and execute films. Lab fee.

- 27.191 Renaissance and Baroque Art** 4 Q.H.  
A selected examination of painting, sculpture and architecture from the fifteenth to the seventeenth century, with special emphasis on the historical and social forces that shaped them.
- 27.192 Art in Boston—Painting** 4 Q.H.  
An exploration of the various styles and directions in painting as practiced in Boston in the past and present. Lectures, discussions and field trips.
- 27.193 Arts of the Old West** 4 Q.H.  
A survey of the arts of the early settlers of the American West, including Indians and frontiersmen, revealed through the building, painting, photography and films of the times.
- 27.194 Life Drawing** 4 Q.H.  
Figure studies in various mediums utilizing the model with the objective of acquiring skills in representing the human form.
- 27.195 Animation—Filmmaking** 4 Q.H.  
The study and application of various animation techniques in weekly lab exercises, lectures and a final student-designed and executed animation film. Lab fee.
- 27.196 Boston Architecture—Past and Future** 4 Q.H.  
An exploration of the architectural elements and environmental forces that have shaped the city with constant reference to its future architectural plans and development. Lectures, discussions and field trips.
- 27.295, 27.296, 27.297 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.
- 27.291, 27.292, 27.293 Directed Study** (each) 4 Q.H.  
Independent work under the direction of members of the Department on a chosen topic. Limited to qualified Junior and Senior students majoring in art history with approval of the Department.

## Music

- 28.100 Music I** 4 Q.H.  
Introduction to selected works of our musical heritage from earliest times to contemporary styles. Primarily a survey and listening course, with emphasis on styles, basic theory, forms, and the historical, social, and artistic periods which these works represent.
- 28.101 Music II** (Prereq. 28.100, 28.102, or 28.106) 4 Q.H.  
An in-depth continuation of 28.100 aimed at the further development of appreciation and understanding of selected works of our musical heritage. The course consists of a detailed study of these works and their relationships to the artistic milieu in which they are created.
- 28.102 Learning to Read and Write Music** 4 Q.H.  
A basic course for those who have wanted to know how to read a score, or how to write a tune. Students will learn to read music at sight, and to compose in some of the basic forms (song, theme and variation, etc.).
- 28.106 Theory I, Tonal Techniques A** 4 Q.H.  
Essentials of tonal technique: fundamentals, ear training, sight singing, and dictation.
- 28.107 Theory II, Tonal Techniques B** (Prereq. 28.100, 28.102, 28.106) 4 Q.H.  
Advanced ear training, sight singing, dictation, and musical analysis; harmonic principles of chords and their inversions.
- 28.112 Music of the Baroque** 4 Q.H.  
The period of the emergence of the orchestra, the chorus and the virtuoso performer; the development of the oratorio, opera, concerto, and symphony in the works of such composers as Monteverdi, Corelli, Handel, Vivaldi, and J.S. Bach.

**28.113 Bach**

4 Q.H.

The genius who summed up the Baroque era. A study of the man whose every note reflected his profoundly humanistic approach to religion. Works include large choral masterpieces such as the *St. Matthew Passion*, the *Brandenburg Concertos*, the *Well Tempered Clavier* and the *Suites*.

**28.115 Music of the Classical Era**

4 Q.H.

That which is classical concentrates on lasting values like form, balance and perfection of detail. Classical music therefore has values which make it meaningful in any period of history. Classicism reached its peak in the latter part of the eighteenth century with Mozart and Haydn whose vocal and instrumental works will be studied in detail.

**28.117 Medieval and Renaissance**

4 Q.H.

The development of sacred and secular monophony, vocal and instrumental works, and of polyphonic music from its beginning to about 1600.

**28.119 Since Webern: The Avant-Garde**

4 Q.H.

The avant-garde in music; total serialism, musique concrete, electronic music, chance music. The avant-garde in jazz, folk, rock, and pop.

**28.120 Survey of Music History**

4 Q.H.

A chronological view of Western music and the men who shaped its course. Selected works which demonstrate the trends in each period will be listened to and discussed with a view to style, continuity, and change. Among the composers whose works will be studied are Machaut, Josquin, Byrd, Bach, Vozart, Beethoven, Berlioz, Wagner, Mahler, and Stravinsky.

**28.123 Music of the Romantic Era**

4 Q.H.

Romantic realism and idealism in the nineteenth century. Emphasis is placed on historical, nationalistic, and literary influences in music. Composers studied include: Beethoven, Schumann, Schubert, Berlioz, Liszt, Chopin, Verdi, Wagner, Brahms, Tschaikovsky, and Mahler.

**28.124 Traditional Folk Music of the Western World**

4 Q.H.

The folk music of Europe, Africa, North and South America, Asia, and Australia. The ethnic music, dances, traditions, epics, and sagas that have influenced Western and Eastern cultures.

**28.125 Great Choral Literature**

4 Q.H.

Analysis of sacred and secular choral literature from medieval to contemporary times.

**28.126 Music as a Means of Social Expression**

4 Q.H.

Deals with the artist's involvement with recurring social themes of man's view of himself, his search for brotherhood, his relation to minority groups and his sexual relationships. Paintings and literary works are used in addition to works by Beethoven, Schoenberg, Britten, and jazz composers.

**28.127 Musical Revolutionary Groups**

4 Q.H.

Deals with the various movements that dared to overthrow the existing musical establishment. These groups include the Florentine "Camerata," The Russian "Five," the French "Six," the Second Viennese School, and the American MT Kisco "Kids."

**28.128 Post Romanticism in Music**

4 Q.H.

The consumation of nineteenth-century Romanticism and the forerunners of twentieth-century Expressionism as seen in the works of Mahler, Bruckner, Strauss, and others.

**28.131 Musical Instruments in Western Culture**

4 Q.H.

The evolution of musical instruments from the Middle Ages to today. General principles of instrument construction and the historical contexts of their use through the ages will be discussed. The evolution of changing tastes in instrumental sound will be illustrated through listening to recordings and, whenever possible, through live performance. Field trips to the Boston Museum of Fine Arts (which houses an excellent early instrument collection), and to various instrument builders in the Boston area will help to give the student a first-hand view of some ancient and some modern instruments.

**28.135 Music of the U.S.A.**

4 Q.H.

American music from Puritan psalm singing to the present time. Folk music of ethnic origin, concert music, ragtime, jazz, and contemporary styles are discussed.

**28.136 Music in Popular Culture**

4 Q.H.

Emphasis on the twentieth century, especially the last 20 years. Thought is given to various subcultures as seen in folk, jazz, rock, and soul. Reference is made to popular music of other countries.

**28.138 Nationalism in Music**

4 Q.H.

Music in the service of the emerging states. Among the composers studied are: The Russian Five, Smetana and Dvorak of Bohemia, Sibelius of Finland, Grieg of Norway, Gade of Sweden, Liszt and Bartok of Hungary, Gottschalk, MacDowell and Ives of the United States.

**28.140 Mozart**

4 Q.H.

A musical development from child prodigy to mature artist is traced from his own letters and from biographies. Many of his major works, including opera, symphonies, concertos, and chamber music, are analyzed in detail.

**28.141 20th-Century Music: Debussy to Schoenberg**

4 Q.H.

The developments in music from 1900 to mid-century. Impressionism, Expressionism, Neo-Classicism, Post Romanticism, and Neo-Nationalism.

**28.142 Stravinsky**

4 Q.H.

Stravinsky: the man who ushered in the twentieth century in music and lived to become a classic. His life and works: *Le Sacre*, *Petrouchka*, *Symphony of Psalms* and more recent works are given detailed attention. His contributions to twentieth-century style—neo-classicism, pandiatonicism, additive style—are analyzed and his strong influence on other composers is noted.

**28.145 Beethoven**

4 Q.H.

An analysis of the complex personality and art of this major figure. His relation to the turbulent times in which he lived; his role in classical and romantic music.

**28.160 The Symphony**

4 Q.H.

A study of the symphony as the major genre in the classical, romantic and contemporary periods. Works by Haydn, Mozart, Beethoven, Schumann, Tchaikovsky, Brahms, Sibelius, Prokofiev, and others are studied.

**28.180 Introduction to Opera**

4 Q.H.

Analysis of opera as a dramatic form. Aria, recitative, ensemble, and other basic elements of opera are isolated and discussed. Numbers Opera, Music Drama, and Singspiel are some of the types of opera considered. Composers whose works are analyzed include Mozart, Wagner, Verdi, and Puccini.

**28.181 Contemporary Opera**

4 Q.H.

Almost every major composer including Schoenberg, Berg, Bartok, Stravinsky, Hindemith, and Poulenc have contributed to the opera repertory, thus illustrating twentieth-century style. Among the works studied are: *Wozzeck*, *The Rake's Progress*, *Dialogue of the Carmelites*, and *Bluebeard's Castle*.

**28.182 Wagner's Ring Cycle**

4 Q.H.

An in-depth study of Wagner's Cycle of music drama; *Das Rheingold*, *Walkure*, *Siegfried*, *Götterdämmerung*, Wagner's compositional techniques (e.g., the use of leitmotif and musical metaphor) is examined in detail.

**28.200 Jazz**

4 Q.H.

Jazz from its origins in New Orleans to the avant-garde experiments of today. The rhythmic, harmonic, instrumental, and stylistic characteristics of jazz are analyzed. Attention is given to the works of creative jazz artists such as Armstrong, Beiderbecke, Parker, Ellington, and Coltrane.

**28.201 The New Jazz**

4 Q.H.

An in-depth study of various recorded works of important jazz performers/composers with

respect to their works as creative artists: Armstrong, Beiderbecke, Ellington, Coltrane, Miles Davis, etc. The study is not chronological but deals with the dynamics of artistic growth and change. Special attention is given to the developments of the last decade: Third Stream, Free Jazz, Eastern influences, electronic instruments, etc.

**28.202 Black Artist in Music** 4 Q.H.  
A study of the contributions of black composers and performers to the world of music.

**28.230 Musical Performance I** (Prereq. Audition or permission of instructor) 1 Q.H.  
Participation in rehearsals and public performances and/or research, composition, arranging, conducting, solo and ensemble activity, etc., with the Chamber Orchestra, the Early Music Players, the N.U. Chorus, the N.U. Bands, or other ensembles, under the supervision and coaching of a faculty member of the Music Department. The student's progress will be evaluated at the end of the quarter by audition or otherwise.

**28.231 Musical Performance II** 1 Q.H.

**28.232 Musical Performance III** 1 Q.H.

**28.233 Musical Performance IV** 1 Q.H.  
(Continuations of 28.230)

**28.240 Piano Class I** 4 Q.H.  
Designed to teach functional piano in a modern electronic piano laboratory on a P.S.I. basis. Keyboard harmony and aspects of tonal memory. A major objective of this course is the development of a progressive keyboard repertoire.

**28.250 Music as a Listening Experience** 4 Q.H.  
This introduction-to-music course is listening-oriented and has been designed to provide tools for the aural appreciation of music. No previous musical knowledge is required or assumed, and the studies deal directly with compositions selected from the masterpieces of music. Organized according to the tenets of P.S.I. (Personalized System of Instruction), the student studies at his own pace under the constant guidance and supervision of the instructor. Grades are determined by the number of units completed and peer-tutor assistance is provided.

**28.260 Methods of Developing Recreational Music** 4 Q.H.  
Students will be instructed in methods of evaluating musical needs and providing these needs to different settings. Methods will be developed in areas such as concert activities (jazz, folk and classical), group activities (choral singing, folk singing and dancing, etc.), and social recreation.

**28.261 Music Therapy** 4 Q.H.  
Examines the application of music as a therapeutic vehicle. The use of music to release suppressed emotions and to encourage self-expression in psychiatric patients; to treat people with speech disorders, facial palsy, and other disorders. Music therapy is currently being considered as a supplemental vehicle to shock and other treatments. Music therapy is a modern approach to supplemental health services.

**28.290 Directed Study** 4 Q.H.  
Independent work in a selected musical area under the direction of members of the department. Limited to qualified students with the approval of the department chairman, and only by special arrangements with the supervising faculty member.

**93.160 American Musical Theatre** 4 Q.H.  
An interdisciplinary course, taught by the departments of Drama and Music. The development of the American musical, from *The Black Crook* to *Hair* and *Jesus Christ Superstar*, as an entertainment and as a serious art-form, through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loew, and Cole Porter are examined. Guest lecturers, recordings, films, live productions supplement the course.

## Drama and Speech

### 29.102 Effective Speaking

3 Q.H.

The study of verbal and nonverbal features of communicative and expressive utterance. Consideration of principles and methods of effective communication in the preparation and delivery of various types of speeches.

### 29.105 Argumentation and Debate

(Prereq. 29.100 or 29.102 or consent of instructor) 4 Q.H.

Argumentation and debate presented as techniques of a free society, bringing reasoned discourse to bear on personal and social problems for purposes of decision and action. Attention is given to the various forms of debating technique.

### 29.106 Speech Fundamentals

3 Q.H.

An overview of speech communication, examining areas of voice and articulation, oral interpretation, and public speaking.

### 29.107 Interpersonal Communications

4 Q.H.

Ways of becoming more aware of self and one's relation to others. An exploration of various options for communicating and increasing one's knowledge of group process.

### 29.108 Business and Professional Speaking

4 Q.H.

Practice on oral presentations, group communication, conference and discussion techniques, interview methods, and occasion speaking. The course combines performance aspects with case study methods of communication on the professional level.

### 29.109 Speech for the Theatre

(Prereq. 29.110) 4 Q.H.

Special speech problems confronting actors performing in classical and contemporary theatre.

### 29.110 Voice and Articulation

4 Q.H.

The study of voice technique: emphasis on pitch, projection, articulation, and vocal variety. A combination of theory and practical application.

### 29.111 Oral Interpretation

4 Q.H.

Application of basic vocal techniques to the dramatic reading of prose, poetry, and drama. Through literary analysis the author's meaning is understood and, by means of oral reading skills, communicated to an audience.

### 29.112 Advanced Voice and Articulation (Prereq. 29.110 or consent of instructor) 4 Q.H.

Development and application of vocal technique acquired in 29.110. Emphasis on vocal analysis, flexibility, regional patterns of speech.

### 29.113 Effective Speaking Workshop

1 Q.H.

Communication through individual speaking and small group conferences.

### 29.114 Advanced Oral Interpretation

(Prereq. 29.111) 4 Q.H.

Further development of oral reading skills acquired in 29.111. In addition, the course includes work with accents and dialects, study of reader's theatre, and an investigation of classical and modern philosophies of the art.

### 29.115 Theories of Persuasion

4 Q.H.

Persuasive discourse as it affects and refutes the process of dynamic social change; approaching critically the theories of persuasion derived from historical, philosophical, and psychological sources and their application to contemporary problems of politicking, mass media, and advertising as they influence attitude, opinion, and action.

### 29.116 Persuasive Techniques

(Prereq. 29.115) 4 Q.H.

Application of the principles of persuasion to preparation and delivery of speeches and to critical analysis of modes of persuasion in representative speeches.

### 29.117 Group Discussion

4 Q.H.

Focus on the task-oriented group; development of skills in decision-making, problem-solving, membership, and leadership. Both the content and the process are discussed and analyzed.

**29.118 Speech Communication in Education**

4 Q.H.

Through lectures, discussions, and performance projects, several activities are investigated. They are: conference and discussion techniques in decision-making situations and as teaching techniques; personal interviews; collective bargaining; and various speech situations involving the teacher's several audiences.

**29.119 Explorations in Communication**

4 Q.H.

Designed to provide basic knowledge and understanding of the processes involved in the transference of meanings. An analysis of contemporary concepts of human communication. Projects in examining cases of communication breakdowns, feedback systems, problems of modern channels, and sender-receiver analysis.

**29.120 Introduction to Theatre Arts** (*For non-Drama Majors*)

4 Q.H.

A brief view of the historical development of acting, directing, and production design. Emphasis on appreciation of contemporary theatrical forms.

**29.121 Survey of the Theatre I**

4 Q.H.

Introduction to the drama as a dynamic medium of human expression; historical development of the theatrical form. Reading and analysis of selected plays as they relate to form, genre and style from the view point of audience and artist.

**29.122 Survey of the Theatre II**

4 Q.H.

Introduction to the theatre as a collaborative art form (theoretical and practical), with an emphasis upon acting, directing, designing, lighting, and the necessities of theatre economics.

**29.123 Propaganda**

(Prereq. 29.115 or 29.119) 4 Q.H.

A descriptive and analytical survey of propaganda techniques and devices used in a conscious attempt to manipulate and ultimately control behavior.

**29.124 Reader's Theatre**

4 Q.H.

A study of the skills necessary to adapt, direct, and perform short stories and novels for public presentation. How to select and work with materials for either educational and/or entertainment purposes.

**29.127 The Mass and the Media**

4 Q.H.

An exploration of the many media through which man expresses himself: i.e., music, art, film, radio, television, theatre, graffiti. Supplementing the course are lectures, films, and attendance at various productions.

**29.128 Contemporary Public Address**

4 Q.H.

A critical study of the public address of leading contemporary speakers representative of important political and social movements.

**29.129 Introduction to Communication Skills**

4 Q.H.

A survey course in the area of speech communication: concepts will be presented and experiences provided in the areas of public address, group discussion, voice, and oral interpretation.

**29.130 Makeup**

4 Q.H.

The principles of, the reasons for, and the materials used in makeup for the theatre, television, and films. The practical application of types and styles of makeup: straight, old-age, character, and corrective.

**29.133 Theories of Audience Behavior**

4 Q.H.

Emphasizes the necessity of the speaker to understand the audience and some methods of collecting data regarding listeners. It is designed to help communicators be more aware of the impact of their audience's knowledge, beliefs, environment, motivation, and expectations upon the communication transaction. Included will be topics such as the psychology of crowds, the creation of rumors, demographic methodology, forms of feedback, and manipulative devices used by sources to elicit desired responses from receivers. The class readings will include historical theories of audiences from LeBon to Roger Brown. Class discussions and films will be supplemented by attendance at various occasions where audiences will be observed and analyzed.

**29.135 20th-Century European Theatre**

4 Q.H.

The work of major European directors and designers who have attempted to develop viable alternatives to nineteenth-century realism. Exploration of the ideas and productions of such persons as Meyerhold, Brecht, Artaud, Grotowski, Vakhtangov, Piscator, Brook, Svoboda.

**29.136 The Theatre of Expanding Consciousness**

4 Q.H.

The avant-garde theatre and its background in the other arts as well as in society. Both the historical development of the avant-garde as well as some of its major themes are explored. An attempt to provide the student with the necessary background for discovering enjoyment and meaning in today's emerging theatre.

**29.137 Women in Western Drama**

4 Q.H.

What is a woman? An examination of the way western society has answered that question as revealed in its drama, from the Greeks to the present day.

**29.140 Consultation Skills**

(Prereq. 29.129) 4 Q.H.

Designed to provide students with skills to analyze communication difficulties in industry, organizations, and groups. The course will include theory, discussion, practice, and feedback.

**29.150 Elementary Acting I**

(Prereq. Drama major or consent of instructor) 4 Q.H.

Fundamental techniques of stage use. The actor and his stage environment. Improvisations for strengthening imagination and increasing freedom. Analysis of scripts for work on performed scenes.

**29.151 Elementary Acting II**

(Prereq. 29.150) 4 Q.H.

Fundamental analysis of the script, including physicalizations and vocal scoring; character analysis; scenes performed for classroom analysis.

**29.152 Intermediate Acting III**

(Prereq. 29.151) 4 Q.H.

Further development of the actor's tools, script and character scoring, exercises for physical and psychological freedom. In-class scenes as works-in-progress.

**29.156 Stage and Body Movement**

(Prereq. Drama major or permission of instructor) 4 Q.H.

A workshop course in movement and improvisation techniques which explore inner resources and allow the actor greater freedom of expression on the stage; analysis of various physical styles used on stage.

**29.160 Concepts of Direction**

(Prereq. Drama major or permission of instructor) 4 Q.H.

Theories of dramatic presentation through analysis of selected historical developments. Purposes and techniques of theatrical direction as they relate to script analysis, production style, pictorial composition, rhythmic evolution, emphatic responses.

**29.161 Problems in Direction**

4 Q.H.

Experimentation in theory related to the staging of classical and modern drama. Analysis of plays of actual production; casting, rehearsals, character interpretations. Each student is responsible for the production of a one-act play.

**29.164, 29.165, 29.166, 29.167 Practicum in Play Production**

(each) 1 Q.H.

Laboratory practice in technical theatre: scene building and painting, and the performing of backstage functions. To be repeated for credit up to four credits.

**29.168 Play Production I**

4 Q.H.

The basics of play production for recreation and education leaders in schools, camps, or settlement houses. Both formal and informal dramatics activities are explored, along with the problems involved in preparing the creative, performing, design, and technical aspects of a production.

**29.169 Play Production II**

4 Q.H.

Continuation of 29.168

**29.170 Scenic Production**

4 Q.H.

Principles which underlie the coordination and execution of scenery for the stage;



examination of different kinds of scenery, tools, equipment, construction materials, and techniques; handling of scenery and basic scene painting. Laboratory work: constructing and painting scenery for University productions.

**29.171 Design and Lighting**

(Prereq. 29.170) 4 Q.H.

The basic principles of design and lighting for the stage; historical analysis of composition and design from classical to modern periods; execution of designs for productions.

**29.172 Scenic Design for the Stage**

(Prereq. 29.170) 4 Q.H.

Practical problems of scene design and methods of approach. Classwork and projects in analysis of a script in terms of visual requirements; elements of design and their application of scenery; methods of inspiration; presentation of ideas including sketches, renderings, models, working drawings, and elevations; basic scene painting and evaluation of designs. Laboratory work includes designing and executing scenery for University productions.

**29.173 Lighting Design for the Stage**

(Prereq. 29.170) 4 Q.H.

Basic principles and practices of stage lighting, including the qualities and functions of light, lighting instruments and controls, basic electricity, color in light, and analysis of the script in terms of light requirements. Students develop light plots and schedules for various kinds of stage productions and frequently design University productions. Class work includes laboratory work on lighting crews for University productions.

**29.174 Scene Painting**

4 Q.H.

The history of scene painting and ornament from classical to contemporary times. Studio organization, color, color theory, equipment, tools, materials, and costs involved with painting stage scenery. Projects and exercises in the use of different media, matching colors, painting of textures, light and shade, and the use of stencils and physical textures. Laboratory sessions include painting stage scenery for University productions.

**29.175 Costuming for the Stage**

4 Q.H.

The theoretical and practical aspects of costuming are covered through a combined lecture/laboratory format. Basic design concepts, techniques of rendering costume plates, pattern drafting, draping, fabric usage, and special effects. Particular emphasis is given to problems of costuming for high school and college theatres.

**29.176 Historic Costume and Design**

(Prereq. 29.175) 4 Q.H.

A survey of historic costume and civil dress through the ages of Western man. Its adaptation and relevance to the problems involved in designing for high school and college stages are the foundation for this area of study. Emphasis is on the use of research sources for design assignments within various periods.

**29.177 Basics of Theatre Design and Style**

4 Q.H.

Visual style and ornamentation for the director, actor, designer, and audience. Examination of the script in terms of visual presentation. Work with the basics of design in relation to theatre and the stage picture created by direction and design. Emphasis on two-dimensional techniques of presentation based on psychology of color, line and form and its effects on an audience. Graphic projects applying various media and techniques to achieve effect or style.

**29.178 Theatrical Crafts**

4 Q.H.

The various crafts as related to theatrical production. Includes an introduction to special fabrics and their uses; texturing methods such as hot glue, batik, aniline and tie dye; construction of specialized accessories such as masks, armor, headdresses, wigs, footwear, and small handprops.

**29.179 Pattern Drafting and Costume Construction**

4 Q.H.

Introduction to basic skills in simple pattern drafting and construction of basic garments. Lab work provides knowledge and skills to design and adjust simple garments. Specifically designed for non-skilled beginners.

**29.180 Playwriting I**

4 Q.H.

The principles and practices of modern dramatic composition: characterization, plot, plot structure, dialogue, and other dramaturgical elements as seen in the one-act play. The writing of brief scenes; the dramatic composition; and the one-act play.

**29.181 Playwriting II**

(Prereq. 29.180) 4 Q.H.

Continuation of 29.180.

**29.185 Children's Theatre**

4 Q.H.

Theories and methods of relating creative techniques to children's programs in schools, churches, and recreational facilities. Analysis of literature in preparation for production of children's plays.

**29.186 Educational Theatre**

4 Q.H.

Drama and drama activities in community, social, health, and educational agencies. Organizing and directing young people's theatre programs.

**29.200 History of the Theatre**

4 Q.H.

Development of the theatre and the drama of Greece and Rome, medieval Europe, Elizabethan and Restoration England, and seventeenth-century France; an examination of playwriting, acting styles, scene design, theatre architecture, and the relationship among these elements.

**29.201 History of the Theatre**

4 Q.H.

Development of the European theatre of the eighteenth, nineteenth, and early twentieth centuries; growth and development of the proscenium theatre; the emphasis upon naturalistic and realistic presentation; theatre innovations.

**29.202 Classic Theatre**

4 Q.H.

The beginnings of theatre and its growth as a potent institution and art form. A detailed study of the interrelation of the dramatic form, theatre structure, and works of major playwrights.

**29.205 The Restoration Theatre**

4 Q.H.

The philosophical, social, historical, and critical influences upon the Restoration theatre and its dramatists.

**29.208 The Irish Theatre**

4 Q.H.

Theatre and drama in Ireland from the beginnings to the present, with the backgrounds of Irish folklore and history. Particular emphasis on developments in the twentieth century.

**29.210 The American Theatre**

4 Q.H.

The American theatre from the Revolutionary War to the present.

**29.211 The Theatre of Williams, Miller, and Albee**

4 Q.H.

An intensive study of the works of three major post-World War II American playwrights.

**29.230 Contemporary Theatre**

4 Q.H.

The various forces that have shaped the major trends in Western theatre over the past two decades. Emphasis upon selected works and contributions of Brecht, Bolt, Miller, Wilder, Baraka, Bullins, Horowitz, the major absurdist and present experimentalists; as well as examinations of contemporary theatrical concerns with nudity, obscenity, homosexuality and the special economic and artistic formulations of the plays we see.

**29.231 The Theatre of the Absurd**

4 Q.H.

The Theatre of the Absurd as an anti-literary reflection of and reaction to life; its effects upon Western drama. Major concern with selected works and ideas of Jarry, Artaud, Camus, Sartre, Beckett, Genet, Ionesco, Pinter, Kopit, Brown, and Arrabal.

**29.232 The Comic Theatre**

4 Q.H.

From its beginnings in the ancient Greek theatre to the performances of the contemporary theatre, an examination of the comic playwright, the comic actor, the comic director—the synthesizing of the arts of the theatre to produce thoughtful as well as titillating laughter. Scripts by such playwrights as Aristophanes, Moliere, Shaw, Neil Simon; techniques of Charlie Chaplin, the Marx Brothers, stand-up comics; and directorial devices will be examined through lecture, film, records, and attendance at live performances.

**29.240 Drama Criticism**

4 Q.H.

An examination of both the major historical statements of drama theory and contemporary drama criticism as evidenced in journalistic play reviews. Students prepare reviews of local productions.

**29.270 Theatre Management** 4 Q.H.  
Theatre management, including problems of financing, promoting, programming for educational, community, profit and not-for-profit professional theatre.

**29.290, 29.291 Directed Study** (each) 4 Q.H.

**29.295, 29.296, 29.297, 29.298 Junior-Senior Honors Program** (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

**93.160 American Musical Theatre** 4 Q.H.

An interdisciplinary course, taught by the departments of Drama and Music. The development of the American musical, from the *Black Crook* to *Hair* and *Jesus Christ Superstar*, as an entertainment and as a serious art-form, through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loewe, and Cole Porter are examined. Guest lecturers, recordings, films and live productions supplement the course.

## English

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.104 Advanced Expository Writing** 4 Q.H.

A practical course in writing direct prose with clarity and precision. Includes various methods of development; diction, style, tone; the article, review, and other forms.

**30.106 English for International Students I** 4 Q.H.

Selected prose literature with a focus on descriptive, narrative, and expository techniques. Weekly papers will be aimed at broadening diction, syntax, and organizational techniques in addition to dealing with responses to form and content.

**30.107 English for International Students II** (Prereq. 30.106) 4 Q.H.

Selected poetry, drama, and short novels with a focus on major aspects of literary form, content, genre, figurative language, and prosody.

**30.108 Creative Writing: Poetry** 4 Q.H.

Practice in various forms and strategies of verse, with specific assignments in different modes; discussion and criticism of student work and selected texts.

**30.109 Creative Writing: Fiction** 4 Q.H.

Conducted as an introduction to fiction writing, with emphasis on the short story. The course is open to students in all disciplines, whether or not they have previously written fiction. The minimum requirements are 10,000 words of original work divided into three assignments. Reading and discussion of manuscripts written by the students occupy the bulk of class time.

**30.110 Literary Analysis: Poetry** 4 Q.H.

Close reading of selected poems, mastery of critical terms, practice in varied critical approaches to poetry. A number of critical papers are written. Required of English majors.

**30.111 Literary Analysis: Fiction** 4 Q.H.

A formal study of selected novels and short stories, mastery of critical terms, practice in varied critical approaches. A number of critical papers required.

**30.112 Literary Analysis: Drama** 4 Q.H.

A formal study of selected plays, mastery of critical terms, practice in varied critical approaches. A number of critical papers required.

**30.113 Freshman Writing** 4 Q.H.

Important principles of logic and rhetoric applied to exposition and argumentation; review of sentence structure, punctuation, and paragraphing; extensive reading and analysis of the essay form; theme assignments.

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.114 Introduction to Literature**

(Prereq. 30.113) 4 Q.H.

An introduction to literary forms: poetry, prose fiction, and drama. Intensive reading of various forms and discussion of different approaches to literature.

**30.115 Great Themes in Literature**

(Prereq. 30.114) 4 Q.H.

Content determined by instructor, who chooses a theme and a number of books from different periods to illustrate it.

**30.120 Introduction to Linguistics**

4 Q.H.

Theories of the nature and origin of language; review of historical and comparative linguistics; differences between written and spoken language, prescriptive and descriptive grammars; structural and generative-transformational phonology, morphology, and syntax; distinctive features; current trends; investigation into dialectology and linguistic field work; methodology regarding unwritten languages.

**30.121 Foundations of the English Language**

4 Q.H.

Development of modern English from pre-Anglo Saxon beginnings; effects of Roman, Scandinavian, and Norman invasions; dialect geography; evolutionary changes, word formation and borrowing; English as an international language; origins of writing and problems of spelling.

**30.124 Traditional Grammar**

4 Q.H.

A reappraisal of traditional grammar in the light of recent advances in grammatical theory; the practical application of such grammar in both studying and teaching English as a medium of expression; supplementary readings by way of transition to the newer grammars.

**30.125 Grammars of English**

4 Q.H.

Designed for students seeking a comprehensive knowledge of English grammar, this course provides a study of structure and usage in English according to traditional, descriptive, and generative (transformational) approaches.

**30.126 Transformational Grammar**

4 Q.H.

The development of the theories of generative-transformational grammars by Noam Chomsky and others, and the development of the skill to construct and operate specific generative-transformational grammars.

**30.130 Introduction to Semantics**

4 Q.H.

The relation between language and behavior, levels of abstraction in communication, habits of evaluation of linguistic phenomena, and the modification of such habits in the direction of human understanding and survival.

**30.140 The Novel of Violence**

4 Q.H.

The hard-boiled tradition in American literature. Works by Fenimore Cooper, Owen Wister, Jack Scheaffer, Ernest Hemingway, Dashiell Hammett, Raymond Chandler, and others are discussed in terms of their response to the conflict between the ideal of community and the ideal of individualism. Critical theories of D.H. Lawrence, R.W.B. Lewis, Leslie Fiedler, Leo Mar, A.N. Kaul, and others are considered.

**30.141 Science Fiction**

4 Q.H.

The myths and rhetorical (scientific and pseudo-scientific) strategies of science fiction from Mary Shelley's *Frankenstein* through current authors such as Vonnegut, Bradbury, Heinlein, Clarke.

**30.142 The Psychological Novel**

4 Q.H.

Concentration on twentieth-century novels whose themes stress individual behavior and motivation, and whose form and style often try to imitate human mental and emotional processes. Authors studied include: Kafka, Dostoevski, Faulkner, Conrad, and Lawrence.

**30.143 Autobiography and Fiction**

4 Q.H.

Autobiography as the product of creative and therefore fictional impulse is studied by examining the way autobiographers shape the facts of their lives into patterns reflecting attitudes toward self. This study is extended to novels narrated by fictional self-historians.

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.144 Literature of the Absurd** 4 Q.H.  
The aesthetic structure and philosophical implications of such significant "absurdist" writers as Beckett, Genet, Vonnegut, Pynchon, and West.

**30.148 Images of Women in Literature** (Prereq. 30.113 and 30.114) 4 Q.H.  
A descriptive and evaluative examination of the archetypes underlying the portrayals of women throughout literary history.

**30.149 Biography** 4 Q.H.  
Offers the student an opportunity to look at the way in which the lives of such people as Janice Joplin, Malcom X, Crazy Horse, Zelda Fitzgerald, Shakespeare, Columbus and others are converted into biographies. Explores the relationships of legend, history, literature and class perspectives of the biographer's art.

**30.151 The Modern Novel** 4 Q.H.  
Outstanding novels of the twentieth century, with emphasis on literary trends and implied social outlook.

**30.152 Modern Drama** 4 Q.H.  
Native and European drama since 1880, with emphasis on the relationship between drama and society in the twentieth century.

**30.154 The Modern Short Story** 4 Q.H.  
Selected British and American writers of the short story, with close attention to contemporary practitioners (Salinger, Malamud, Roth) as well as to major figures (Joyce, Lawrence, Faulkner).

**30.160 New Topics in Literature** 4 Q.H.  
This experimental course deals with a different topic each fall/winter and spring/summer, providing the opportunity for student to study unusual or nontraditional aspects of literature. Sample possibilities: Gothic and Horror Fiction, Victorian Children's Literature, and the Literature of Utopia. Topic will be preannounced.

**30.161 New Topics in Literature** 4 Q.H.  
Not a continuation of 30.160, but the same course with a different topic.

**30.162 Major Figure** 4 Q.H.  
Devoted entirely to the work of a single writer, with a different one each fall/winter and spring/summer: i.e., Wordsworth, Joyce, Tolstoy, Dickens. Subject will be preannounced.

**30.163 Major Figure** 4 Q.H.  
Same as 30.162 but with a different writer.

**30.164 Business Tradition in Literature** 4 Q.H.  
Examines the various images of the businessman found in literature as new frontier opportunities for the accumulation of wealth opened up. Biographies, autobiographies, novels, plays, and films will be examined to study the many facets to the characters of these captains of industry and to determine the impact they have made on society.

**30.165 Literature and the Law** 4 Q.H.  
Uses imaginative literature to investigate the problems of crime and justice as they occur throughout time, from ancient Greek tragedies to modern American novels. The readings enable the student to discover the changing nature of the criminal—hero or victim or villain—and to deal with the social, psychological, and political facts that define him.

**30.166 Urban Life and Literature** 4 Q.H.  
The rise of the European and American metropolis has alternately been blessed by writers or excoriated for its life-denying environment. In a survey highlighting such writers as Gay, Balzac, Dickens, Gissing, Ellison and others, the urban crisis is explored for its psychological and sociological expression. Two main images emerge in their writings: the city as opportunity and the city as destroyer. The course also attempts to show how literary form is in

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

part a response to sociological reality, and that the realistic novel's emergence may be explained in these terms.

**30.167 Literature and Politics**

4 Q.H.

Explores ways authors of imaginative literature from Sophocles to Mailer represent the religious, moral, and ethical conflicts arising from the acquisition, use, and misuse of political power. The literature falls into several categories—utopian, which establishes a conflict between the ideal and the real; satirical, which threatens a power structure by exposing it to scorn; analytic, which describes the rise to and fall from power of individuals, parties, or states; and investigative, which takes the reader inside a power elite to observe its inner operations—and examines the difference between the ideal of government and its reality.

**30.168 Science and Literature**

4 Q.H.

Examines the literary methods used by scientists to involve us in their experiences and discoveries. Many of the most creative minds of science have left literary works, full of clarity, vigor, and emotive power. Explores a variety of these works from antiquity to the present to see how the creativity of the scientist is fundamentally the same as the creativity of the man of letters. Readings will be drawn from astronomy, physics, natural history, biology, mathematics, and psychology.

**30.169 Language and Film**

4 Q.H.

Explores the way film translates the written word to a visual experience and shows how film techniques extend meaning. *Bonnie and Clyde*, *Dr. Strangelove*, *King Kong*, *Hospital*, and *Mondo Cane* are among the more than 20 films shown during weekly screening sessions. Students will have an opportunity to develop such cinematic interests as grow out of the study of language and film. Lab fee.

**30.170 Survey of English Literature I**

4 Q.H.

English literature to 1800.

**30.171 Survey of English Literature II**

4 Q.H.

English literature from 1800 to the present.

**30.178 Shakespeare on Film**

(Prereq. 30.113 and 30.114) 4 Q.H.

This course will examine the various treatments of Shakespeare's plays on film. It will be concerned with the various technical aspects of film and how these have been used by various directors to transfer Shakespeare's plays from the stage to the screen. This course does not fulfill the Shakespeare requirement for English majors. Lab fee.

**30.179 Gothic Fiction**

(Prereq. 30.113 and 30.114) 4 Q.H.

Examination of fifty years of Gothic Fiction from Walpole's *Castle of Otranto* in 1764 to Maturin's *Melmoth the Wanderer* in 1820. Included will be the study of the Gothic movement—its aims, features, successes and failures and the development of Gothicism in the next two centuries. Finally the influence of Gothicism on contemporary movies and literature will be studied.

**30.180 Survey of American Literature I**

4 Q.H.

American literature to 1860.

**30.181 Survey of American Literature II**

4 Q.H.

American literature from 1860 to the present.

**30.182 Major American Novels**

4 Q.H.

An intensive analysis of the themes, forms, and techniques of American novelists of the nineteenth and early twentieth centuries. Critical papers are required.

**30.183 Major American Novels**

4 Q.H.

An intensive analysis of the themes, forms, and techniques of modern American novelists. Critical papers are required.

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.186 Early American Literature** 4 Q.H.  
The development of early American culture of the colonial and federal periods. Letters, narratives, verse, polemics, the Federalist Papers, etc.

**30.187 New England Renaissance** 4 Q.H.  
An intensive survey of transcendentalism, and relevant works of Melville and Hawthorne.

**30.188 American Romanticism** 4 Q.H.  
An intensive survey of Poe, Melville, Whitman, Dickinson, and others.

**30.189 American Realism** 4 Q.H.  
American literature from the Civil War to Norris, Crane, Twain, and James.

**30.190 Modern American Literature** 4 Q.H.  
Fiction, drama, and poetry from the turn of the century to the mid-forties.

**30.191 Children's Literature** (Prereq. 30.113 and 30.114) 4 Q.H.  
This course surveys the history of children's literature in terms of its major genres, including myths, folk and fairy tales, fantasy, nursery rhymes, and short stories and novels. Emphasis on the psychology of creation, the imagination, and the role of fantasy and play in books for children.

**30.195, 30.196 Freshman Honors** 4 Q.H.  
Advanced Placement for freshmen.

**30.204 Practical Writing** 4 Q.H.  
Designed for people who wish to write professionally, but who are not primarily interested in writing fiction or poetry. Discussions on how to write and edit essays, advertisements, feature stories, articles, film strips, news stories, news releases, technical manuals, house organs, industrial films, direct mail, radio commercials. Guest lecturers from various professions appear from time to time.

**30.207 Writing for the Professions: Criminal Justice** (Prereq. 30.113, 30.114) 4 Q.H.  
Designed to serve the professional writing needs of students in the College of Criminal Justice through instruction in formal rhetoric and practice with a variety of professional forms.

**30.208 Poetry Workshop** (Prereq. 30.108) 4 Q.H.  
An advanced workshop course in the writing and examination of original student poems. Students are expected to be willing to experiment in some established poetic forms of their own choosing as well as produce their own original work.

**30.209 Advanced Fiction Writing** (Prereq. 30.109 or permission of instructor) 4 Q.H.  
Reading and discussion of student manuscripts (longer and more complex than those developed in 30.109, Creative Writing: Fiction).

**30.210 Major British Novelists** 4 Q.H.  
The eighteenth-century English novel, with special attention to Defoe, Fielding, Smollett, Sterne, the Gothic novelists, and Austen; the development of the English novel and the characteristic quality of eighteenth-century fiction.

**30.211 Major British Novelists** 4 Q.H.  
The nineteenth-century English novel, with special attention to the Brontes, Thackeray, Trollope, Eliot, Meredith, Gissing, and Hardy; the Victorian frame of mind as seen in the novels.

**30.218 Medieval English Literature** 4 Q.H.  
Major works in Middle English: *Sir Gawain*, *Piers Plowman*, and *Pearl*.

**30.219 Major British Dramatists: Restoration and 18th Century** 4 Q.H.  
Major dramatists from 1660—1800. Among those studied are: Etherege, Wycherley, Congreve, Dryden, Addison, Goldsmith, and Sheridan.

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.220 Major British Dramatists: Elizabethan and Jacobean** 4 Q.H.

The origin, theme, form, technique, and poetry of such dramatists as Kyd, Webster, Tourneur, Fletcher, and Beaumont, with particular emphasis on the works of Marlowe, Jonson, and Ford.

**30.221 Major British Dramatists: 19th Century and Modern** 4 Q.H.

British drama with particular emphasis on the poetic and experimental in the works of Shaw, Synge, Yeats, O'Casey, Eliot, Behan, Pinter, and Beckett.

**30.222 Chaucer** 4 Q.H.

Selected *Canterbury Tales*.

**30.223 Chaucer** 4 Q.H.

Selected *Canterbury Tales* and Chaucer's early poems.

**30.224 Spenser** 4 Q.H.

Selected early poems and portions of the *Fairie Queene*.

**30.225 Milton** 4 Q.H.

Concentration on Milton's *Paradise Lost*, with supplementary readings in his minor poems and prose.

**30.230 17th-Century English Literature** 4 Q.H.

Major writers of the first half of the century, with special emphasis on Bacon, Jonson, and the metaphysical poets, Donne and Herbert; the effect of science on the literature and the thinking of the times.

**30.231 17th-Century English Literature** 4 Q.H.

Major writers of the second half of the century, with emphasis upon Dryden and Milton. Satire as a literary genre and its relationship to the times.

**30.236 18th-Century English Literature** 4 Q.H.

Significant dramatic works of the period and the writings of Pope and Swift.

**30.237 18th-Century English Literature** 4 Q.H.

Writings of Dr. Johnson, Boswell, and Blake.

**30.240 19th-Century English Literature: The Romantics I** 4 Q.H.

The poetry of Blake, Wordsworth, Coleridge, and related critical material; the relationship between the poetry and the time.

**30.241 Early Victorian Literature, 1830-1870** 4 Q.H.

Survey of the major literary forms of the period. Readings in Tennyson, Browning, Arnold, Carlyle, Mill, Ruskin, and Dickens.

**30.242 19th-Century English Literature: The Romantics II** 4 Q.H.

The poetry of Byron, Shelley, Keats, and related critical material; the essays of Lamb, Hazlitt, and DeQuincey.

**30.243 Later Victorian Literature, 1870-1900** 4 Q.H.

Emphasis on the movement toward "modernism" in the later nineteenth century. Readings in Pater, G.M. Hopkins, Wilde, Hardy, and the early work of G.B. Shaw and Conrad.

**30.246 20th-Century Literature: Poetry and Drama** (Prereq. 30.113 and 30.114) 4 Q.H.

A study of British and Continental poetry and drama from 1900-present, including Shaw, Ibsen, Pirandello, Beckett, Sartre, Ionesco, Rilke, Yeats, Eliot, and Auden.

**30.247 20th-Century Literature: The Novel** (Prereq. 30.113 and 30.114) 4 Q.H.

A study of the development of the British and Continental fiction from 1900-present. Camus, Grass, Bahel, Nabokov, Conrad, Joyce, Lawrence, Greene, Lessing, Murdoch and Fowles will be studied.

**30.248 16th-Century Literature** (Prereq. 30.113 and 30.114) 4 Q.H.

The beginnings of the modern period. The course will concentrate on sonnets, love lyrics and erotic narrative poetry, principally Wyatt, Sidney, Marlowe and Shakespeare.



**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.249 Masterpieces of World Literature** (Prereq. 30.113 and 30.114) 4 Q.H.

This course will include a selection of "great books," primarily by non-English authors of works that have been central to the development of Western thought and culture.

**30.250 Shakespeare** 4 Q.H.

A chronological approach to Shakespeare's plays, beginning with *Romeo and Juliet* and ending with *Julius Caesar*. Emphasis on diction, dramatic structure, and psychology.

**30.251 Shakespeare** 4 Q.H.

Shakespeare's middle and last phases (*Hamlet* to *The Tempest*); selected plays.

**30.260 The Bible** 4 Q.H.

A close study and textual analysis of selected books of the Bible. The assigned texts are especially considered in their historical and literary aspects.

**30.261 Mythology** 4 Q.H.

The mythological patterning of human experience; the philological and anthropological approaches to specific myths, especially those of the Greeks; and the themes of sacrifice and change.

**30.262 Literary Criticism: Approaches to Literature** 4 Q.H.

Exercises and readings in ancient and modern theories of literature. Included are: Marxist, Freudian, Jungian and New Critical theories, as well as selections from Plato, Aristotle and the Romantics.

**30.263 Modern Poetry I** 4 Q.H.

A study of the origin and development of modern poetry. Poets studied are: Hardy, Yeats, Robinson, Frost, Stevens, Moore, Eliot, and Pound. Recommended for students who have already had an introductory course in poetry.

**30.264 Modern Poetry II** 4 Q.H.

A continuation of 30.263, with emphasis on the later work of Eliot and Pound, William Carlos Williams, the Objectivists, the Fugitives (Ransom, Tate, Warren), Auden, Lowell, Roethke, Dylan Thomas, and the "new poets" from 1945 to 1960.

**30.266 Literary Criticism: Myth and Archetypal** 4 Q.H.

Exercises and readings in selected schools of myth and archetypal literary criticism.

**30.267 African-American Literature** 4 Q.H.

A survey of the development and range of black American writers, emphasizing poetry and prose from the post-Civil War period to the present.

**30.268 African-American Literature** 4 Q.H.

Continuation of 30.267.

**30.269 The Black Novel** 4 Q.H.

A study of the black novel—its theme, structure, and style—and its historical, cultural, and literary importance.

**30.270, 30.271 Junior Seminar** 4 Q.H.

**30.272 Studies in English Literature** 4 Q.H.

A seminar course on a special topic which is announced in advance. Examples: The Pre-Raphaelites, Literature and Psychology, and John Donne.

**30.273 Studies in English Literature** 4 Q.H.

Continuation of 30.272.

**30.274 Studies in American Literature I** 4 Q.H.

A seminar course on a special topic announced in advance. Examples: Puritanism, Early Drama, and The Genteel Tradition.

**30.275 Studies in American Literature II** 4 Q.H.

Continuation of 30.274.

**Prerequisite for all English courses is a minimum of Freshman English (30.113 and 30.114) or equivalent.**

**30.276 African Literature** 4 Q.H.

An in-depth study of African writers such as Achebe, Armah, Laye, and Fanon.

**30.280, 30.281 Senior Seminar** (each) 4 Q.H.

**30.290, 30.291 Directed Study** (each) 4 Q.H.

**30.295, 30.296, 30.297, 30.298 Junior-Senior Honors Program** (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## French

*Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. If approved by the Department of Modern Languages and the Dean's Office, equivalent course work done elsewhere may be considered acceptable to satisfy these prerequisites.*

**31.201 Elementary French I** 4 Q.H.

Essentials of grammar; practice in speaking and reading; progressive acquisition of basic language skills.

**31.202 Elementary French II** (Prereq. 31.201) 4 Q.H.

Continuation of grammar study and basic language skills; reading of French of increasing difficulty; practice in conversation.

**31.203 Intermediate French I** (Prereq. 31.202) 4 Q.H.

Continuation of grammar, oral practice, and the reading of selected texts.

**31.204 Intermediate French II** (Prereq. 31.203) 4 Q.H.

**31.205 Reading French in the Arts and Sciences** (Prereq. 31.202 or equiv.) 4 Q.H.

Designed for those students who wish to develop their reading skills, without regard to other aspects of the language such as speaking or writing. To this end, the grammar necessary for reading is stressed, together with vocabulary building. Scientific and nonscientific texts are read. This course is also very helpful for students, graduate and undergraduate, who need to pass a reading examination to fulfill specific degree requirements. However, it should be made clear that this course is not a substitute for 31.203 and 31.204 (Intermediate French).

**31.217 French Literature in Translation** 4 Q.H.

An elective course for all students, offering a study of some of the most significant works of French literature in translation. The topic will vary from year to year. Language majors would receive major credit for this course *only* by making special arrangements with the instructor for extra work to be done.

**31.219 Cherchez la Femme! Women in French Literature of the 18th and 19th Centuries** 4 Q.H.

A one-quarter course conducted in English of French literature in translation. An opportunity to see how woman is viewed by some of the great French novelists of the eighteenth and nineteenth centuries. The class meetings alternate between lectures and group discussions of literary, psychological and sociological issues raised by the texts. A reading knowledge of French is desirable, but *not* essential.

**31.227 French Composition and Conversation I** (Prereq. 31.204) 4 Q.H.

Aiming at perfect speaking and writing ability: the basis of work is analysis of the language, oral and written reports and general discussions. Conducted in French.

**31.228 French Composition and Conversation II** (Prereq. 31.227) 4 Q.H.

Continuation of 31.227, with stress on individual work, free discussions, and compositions. Conducted in French.

- 31.229 Advanced French Proficiency I** 4 Q.H.  
(Prereq. French Composition and Conversation I and II or equiv.) 4 Q.H.  
Emphasis is on a further vocabulary building and mastery of fine points of grammar through written composition, prepared oral reports, and reading and discussion of articles from current periodicals. Special attention is given to the latest trends in spoken French, the study of idioms and proverbs, as well as selected examples of "argot" (slang).
- 31.230 Advanced French Proficiency II**  
(Prereq. French Composition and Conversation I and II or equiv.) 4 Q.H.  
This course is the continuation of 31.229. In addition to further study in the areas covered in course 31.229, each student pursues one major project throughout the course, to be completed at the end of the quarter—such as the planning and the writing of an original French magazine article, with one article to be submitted each week of the term.
- 31.231 Masterpieces of French Literature I** (Prereq. 31.204) 4 Q.H.  
Introductory course in French literature. Selected works from the Middle Ages to the eighteenth century.
- 31.232 Masterpieces of French Literature II** (Prereq. 31.204 or equiv.) 4 Q.H.  
Introductory course in French literature. Selected works from the nineteenth and twentieth centuries.
- 31.233 Applied French Linguistics** (Prereq. 30.120) 4 Q.H.  
For teachers or prospective teachers of French: phonemes and allophones, breath groups and sentences, intonation patterns, comparison between oral and written French.
- 31.243 French Classicism** (Prereq. 31.232 or equiv.) 4 Q.H.  
Intellectual currents and other nondramatic literature of the seventeenth century.
- 31.244 French Classicism** (Prereq. 31.232 or equiv.) 4 Q.H.  
Dramatic literature of the seventeenth century. Plays of Corneille, Moliere, and Racine.
- 31.245 French Literature of the 18th Century** (Prereq. 31.232 or equiv.) 4 Q.H.  
The progress of the philosophical spirit and rationalistic thinking as reflected in the works of Fontenelle, Bayle, Montesquieu, Voltaire, and others.
- 31.246 French Literature of the 18th Century** (Prereq. 31.232 or equiv.) 4 Q.H.  
The achievements of the spirit of enlightenment and the awakening of the romantic sensibility, as seen in such authors as Diderot, Rousseau, St. Pierre, and Beaumarchais. Conducted in French.
- 31.247 French Literature of the 19th Century** (Prereq. 31.232 or equiv.) 4 Q.H.  
Romantic poetry and drama; the realist novel.
- 31.248 French Literature of the 19th Century** (Prereq. 31.232 or equiv.) 4 Q.H.  
Flaubert; Parnassian and Symbolist poetry.
- 31.249 French Literature of the 20th Century** (Prereq. 31.232 or equiv.) 4 Q.H.  
Narrative and dramatic prose writers prior to World War II, including Proust, Claudel, Gide, and Mauriac.
- 31.250 French Literature of the 20th Century** (Prereq. 31.232 or equiv.) 4 Q.H.  
The prose literature of present-day France as illustrated by the works of Sartre, Camus, Ionesco, and others.
- 31.280 Seminar: Critical Methodology and Practice in French Literature**  
(Prereq. excellent reading knowledge of French) 4 Q.H.  
The seminar will treat one modern French writer in terms of a critical methodology developed in the first part of the seminar. This methodology will be based on modern critical practice and will train the student to think about and apply concepts of criticism. Fall 1976 topic: Camus.
- 31.290, 31.291, 31.292, 31.293 Directed Study** (each) 4 Q.H.
- 31.295, 31.296, 31.297, 31.298 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Spanish

*Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere may be considered acceptable to satisfy these prerequisites.*

### **32.201 Elementary Spanish I** 4 Q.H.

Essentials of grammar; practice in pronunciation; progressive acquisition of a basic vocabulary and idiomatic expressions.

### **32.202 Elementary Spanish II** (Prereq. 32.201) 4 Q.H.

Continuation of grammar study. Oral and written exercises; reading of basic Spanish prose.

### **32.203 Intermediate Spanish I** (Prereq. 32.202) 4 Q.H.

Intensive grammar review. Reading of modern prose and poetry, with occasional oral or written translation. Basic elements of composition and conversation practice based on assigned readings.

### **32.204 Intermediate Spanish II** (Prereq. 32.203 or equiv.) 4 Q.H.

Intensive reading of modern Spanish prose and poetry of moderate difficulty. Further practice in composition and continued conversation practice based on assigned readings.

### **32.209 Conversational Spanish I** (*Open to non-majors only*)

(Prereq. 32.204 or equiv.) 4 Q.H.

Emphasis on developing the student's ability to speak Spanish and to comprehend it. Ordinarily, the entering student will have completed 32.204, or the equivalent, but particularly able students may be accepted after having completed only 32.202. In this case, the sequence 32.209-210 may be used to satisfy the language requirement.

### **32.210 Conversational Spanish II** (Prereq. 32.209 or equiv.) 4 Q.H.

Continuation of 32.209, with continuing emphasis on the development of oral facility in Spanish.

### **32.211 Advanced Conversational Spanish** (*Open to non-majors only*)

(Prereq. 32.210 or equiv.) 4 Q.H.

Continuation and more intensive practice of work begun in 32.210.

### **32.213 Readings in Spanish Literature** (*Open to non-majors only*)

(Prereq. 32.204 or equiv.) 4 Q.H.

The opportunity to read some of the most interesting works of Spanish literature without the intensive survey required in the Masterpieces course. Conducted in English.

### **32.214 Readings in Latin American Literature** (Prereq. 32.204 or equiv.) 4 Q.H.

Companion course to 32.213. Emphasis upon the literature of Latin America. Conducted in English.

### **32.215 Backgrounds in Hispanic Culture I** 4 Q.H.

Open to all interested students. A reading knowledge of Spanish is helpful, but *not* essential. This course provides a multimedia survey of Spanish culture: slides, concerts, films, field trips, and guest lecturers utilized. Language majors should consult with the instructor concerning possible major credit. Conducted in English.

### **32.216 Backgrounds in Hispanic Culture II** (Prereq. 32.204 or equiv.) 4 Q.H.

Reading knowledge of Spanish required. This course begins with a survey of the three most important pre-Columbian cultures (Incas, Mayas, and Aztecs). Subsequently, the focus is on intellectual history of Latin America. Readings include *Carta de Jamaica* and *Discurso ante el Congreso de Angostura*.

### **32.227 Spanish Composition and Conversation I** (Prereq. 32.204 or equiv.) 4 Q.H.

Practice in writing and speaking Spanish, including written and oral resumes, prepared speeches and themes, impromptu speaking and writing. A review of the more subtle problems of grammar.

### **32.228 Spanish Composition and Conversation II** (Prereq. 32.227 or equiv.) 4 Q.H.

Further practice in oral and written Spanish; continued study of problems of advanced Spanish grammar.

**32.229 Advanced Spanish Proficiency I** (Prereq. consent of instructor) 4 Q.H.  
Designed for those preparing to enter the teaching profession, as well as qualified advanced students. Advanced elements of Spanish syntax, with emphasis upon achieving superior speaking, reading, and writing skills.

**32.230 Advanced Spanish Proficiency II** (Prereq. 32.229 and consent of instructor) 4 Q.H.  
Continuation of aims and goals of 32.229.

**32.231 Masterpieces of Spanish Literature I** (Prereq. 32.204 or equiv.) 4 Q.H.  
Introductory course in Spanish literature. Selected works from the Middle Ages to the *Siglo de Oro*.

**32.232 Masterpieces of Spanish Literature II** (Prereq. 32.204 or equiv.) 4 Q.H.  
Introductory course in Spanish literature. Selected works from the nineteenth and twentieth centuries.

**32.239 Spanish Literature of the Middle Ages** (Prereq. 32.232 or equiv.) 4 Q.H.  
Selections from the major works of the Middle Ages, from the *Poema del Cid* to the *Libro de buen amor*.

**32.241 Spanish Literature of the 15th and 16th Centuries** (Prereq. 32.232 or equiv.) 4 Q.H.  
Selections from the major works of the fifteenth and sixteenth centuries, from *La Celestina* to mysticism.

**32.243 Spanish Literature of the Golden Age** (Prereq. 32.232 or equiv.) 4 Q.H.  
Cervantes; selections from the *Entremeses*, the *Novelas ejemplares*, and *Don Quijote*, with emphasis on the latter as Spain's greatest literary masterpiece.

**32.244 Spanish Literature of the Golden Age** (Prereq. 32.232 or equiv.) 4 Q.H.  
Readings from the *comedias* of Lope de Vega, Tirso de Molina, Galderon, and Ruiz de Alarcon; also prose and poetry selections from Gongora and Quevedo.

**32.247 Spanish Literature of the 19th Century** (Prereq. 32.232 or equiv.) 4 Q.H.  
Readings in the prose, poetry, and drama of the romantic period, including selections from el Duque de Rivas, Larra, Espronceda, Zorrilla, and Becquer.

**32.248 Spanish Literature of the 19th Century** (Prereq. 32.232 or equiv.) 4 Q.H.  
A study of some of the major novelists of the second half of the nineteenth century.

**32.249 Spanish Literature of the 20th Century** (Prereq. 32.232 or equiv.) 4 Q.H.  
Selections from the writings of the Generation of '98: Unamuno, Valle-Inclan, Pio Baroja, Benavente, Azorin, and the Machado brothers.

**32.250 Spanish Literature of the 20th Century** (Prereq. 32.232 or equiv.) 4 Q.H.  
Prose and poetry of modern writers, such as Ortega y Gasset, Perez de Ayala, Garcia Lorca, Juan Ramon Jimenez, Gironella, and Jose Cela.

**32.251 Latin American Literature** (Prereq. 32.232 or equiv.) 4 Q.H.  
Early Latin American literature; the literature of the colonial period and the early nineteenth century based primarily on selections from an anthology.

**32.252 Latin American Literature** (Prereq. 32.232 or equiv.) 4 Q.H.  
Modern Latin American literature; readings from nineteenth and twentieth century prose and poetry.

**32.280 Spanish Seminar** 4 Q.H.  
This course is designed primarily for majors who have progressed to the upper level literature courses in Spanish. However, non-majors, who show exceptional background may be admitted with the instructor's permission. The course will focus upon a narrowly defined theme (i.e., a single author, a single work, or a single theme). However, through outside reading and discussion, students will explore the topic in depth, and will be expected to present a final paper based upon individual research.

**32.290, 32.291, 32.292, 32.293 Directed Study** (each) 4 Q.H.

**32.295, 32.296, 32.297, 32.298 Junior-Senior Honors Program** (each) 4 Q.H.  
 For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## German

*Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.*

**33.201 Elementary German I** 4 Q.H.  
 Essentials of grammar, practice in pronunciation, acquisition of a basic vocabulary, idiomatic expressions.

**33.202 Elementary German II** (Prereq. 33.201) 4 Q.H.  
 More difficult points of grammar; reading of simple German prose, with oral and written exercises.

**33.203 Intermediate German I** (Prereq. 33.202) 4 Q.H.  
 Reading practice, using texts of average difficulty; review of grammar; written and oral exercises.

**33.204 Intermediate German II** (Prereq. 33.203) 4 Q.H.  
 Readings from modern German prose; practice in speaking and writing.

**33.205 Reading German in the Arts and Sciences** 4 Q.H.  
 A one-quarter course designed to give students sufficient knowledge of German grammar and sentence structure to enable them to translate critical and scientific texts with the aid of a dictionary. Students do not learn to speak or write German; instead, class time is devoted to the acquisition of the grammar necessary for translation, as well as to practice in translating texts from various scientific and humanistic fields. May not be used to fulfill a language requirement.

**33.207 Scientific German** (Prereq. 33.204, 33.205, or equiv.) 4 Q.H.  
 Review of grammar and syntax; advanced readings in expository German. Articles dealing with chemistry, physics, mathematics, biology, and other disciplines in the arts and sciences, in keeping with the students' major fields.

**33.217 German Literature in Translation I** 4 Q.H.  
 Elective open to all students. Offers a study of some of the most significant works of German literature in translation. Topics vary from year to year. Language majors receive major credit for this course *only* by making special arrangements with the instructor for extra work to be done. Conducted in English.

**33.218 German Literature in Translation II** 4 Q.H.  
 Companion course to 33.217. Readings center around the theme of "The Search for Identity." Novels and plays by such twentieth-century German authors as Mann, Rilke, Frisch, and Durrenmatt are read.

**33.227 German Composition and Conversation I** (Prereq. 33.204) 4 Q.H.  
 Aimed at developing writing and speaking ability. Some grammar review and weekly compositions; prepared and impromptu speaking on a variety of topics dealing with everyday German life.

**33.228 German Composition and Conversation II** 4 Q.H.  
 Extensive practice in speaking and writing German. Oral comprehension and vocabulary building.

**33.231 Masterpieces of German Literature I** (Prereq. 33.204 or equiv.) 4 Q.H.  
 Readings of twentieth-century works accompanied by selections from major writers extending from the *Hildebrandslied* to Luther.

- 33.232 Masterpieces of German Literature II** (Prereq. 33.204 or equiv.) 4 Q.H.  
Readings of nineteenth-century works accompanied by selections from major writers from Luther to the present.
- 33.245 Classical Period of German Literature** (Prereq. 33.232 or equiv.) 4 Q.H.  
Background and general survey of the period from 1750 to 1800, with particular emphasis on the works of Lessing and Schiller. Lectures and collateral readings.
- 33.246 The Works of Goethe** (Prereq. 33.232 or equiv.) 4 Q.H.  
Dramas, prose writings, and lyric poetry of Goethe. Lectures, collateral readings, reports.
- 33.247 German Literature of the 19th Century** (Prereq. 33.232 or equiv.) 4 Q.H.  
Background and general survey of German literature in the nineteenth century, with particular attention to prose and lyric poetry.
- 33.248 German Drama of the 19th Century** (Prereq. 33.232 or equiv.) 4 Q.H.  
Plays by Kleist, Hebbel, Grillparzer, and Ludwig. Lectures, collateral readings, reports.
- 33.249 German Literature of the 20th Century** (Prereq. 33.232 or equiv.) 4 Q.H.  
Recent German literature, particularly prose and lyric poetry.
- 33.250 German Drama of the 20th Century** (Prereq. 33.232 or equiv.) 4 Q.H.  
Plays by Schnitzler, Hofmannsthal, Wedekind, Kaiser, Toller, Unruh, and Weichert.
- 33.251 The German Lyric** (Prereq. 33.204 or equiv.) 4 Q.H.  
German lyric poetry from the twelfth century to the present. Analysis of selected poems, reports, discussions.
- 33.252 The Dramatic Works of Franz Grillparzer** (Prereq. 33.204 or equiv.) 4 Q.H.  
Reading, analysis and interpretation of selected plays of Franz Grillparzer, Austria's greatest dramatist. Collateral readings, discussions, reports.
- 33.290, 33.291, 33.292, 33.293 Directed Study** (each) 4 Q.H.
- 33.295, 33.296, 33.297, 33.298 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Russian

*Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.*

- 34.201 Elementary Russian I** 4 Q.H.  
Essentials of grammar, practice in pronunciation, progressive acquisition of a basic vocabulary, idiomatic expressions.
- 34.202 Elementary Russian II** (Prereq. 34.201) 4 Q.H.  
Continuation of grammar study; oral and written exercises.
- 34.203 Intermediate Russian I** (Prereq. 34.202) 4 Q.H.  
Designed to further the student's knowledge of Russian through oral and written work; the study of grammar and reading in texts of moderate difficulty.
- 34.204 Intermediate Russian II** (Prereq. 34.203) 4 Q.H.  
Continuation of work and aims of 34.203.
- 34.207 Scientific Russian** (Prereq. 34.204 or equiv.) 4 Q.H.  
Readings of Russian texts in mathematics, physics, chemistry, astronomy, biology, and medical science. Designed to prepare the student for the departmental reading examination he may wish to take in his chosen field. As far as possible, texts are selected on the basis of the students' needs and interests.
- 34.215 Backgrounds of Russian Culture** 4 Q.H.  
Conducted in English. Designed to give the student a view of all aspects of Russian culture

and civilization. The course utilizes guest speakers, films, field trips, and discussions in its presentation. Language majors should consult with the instructor concerning possible major credit.

**34.217 The Works of Alexander Pushkin in English Translation** 4 Q.H.  
A survey and analysis in English of Alexander Pushkin's artistic prose, his lyric, his correspondence, and *Eugene Onegin* (his novel in verse). Some attention is devoted to the story of his life, literary friendships, and major literary influences. Language majors should consult with the instructor concerning possible major credit.

**34.218 Russian Literature in Translation** 4 Q.H.  
This is a companion to 34.217. It is a survey and analysis in English of some of the works of Tolstoi, Dostoevski, Chekhov, and others. The classes will be conducted entirely in English, and there are no prerequisite courses. Language majors should consult with the instructor concerning possible major credit for the course.

**34.227 Russian Composition and Conversation I** (Prereq. 34.204) 4 Q.H.  
Designed to develop skills in speaking and writing of colloquial Soviet usage of the Russian language. Classroom work is supplemented with tapes.

**34.228 Russian Composition and Conversation II** (Prereq. 34.227) 4 Q.H.  
A continuation of 34.227.

**34.229 Advanced Russian Proficiency I** (Prereq. 34.228 or consent of instructor) 4 Q.H.  
The course will emphasize speaking and writing skills through the use and study of Russian idioms and colloquialisms. Language lab exercises will concentrate on improving listening comprehension. Classes conducted in Russian.

**34.230 Advanced Russian Proficiency II** (Prereq. 34.229 or consent of instructor) 4 Q.H.  
Further practice in speaking and writing and a continuation of the goals of course 34.229. Conducted in Russian.

**34.247 Russian Short Stories of the 19th Century** (Prereq. 34.204) 4 Q.H.  
Detailed analysis of selected representative plays read in Russian; study of the development of this genre.

**34.248 Russian Drama of the 19th Century** (Prereq. 34.204) 4 Q.H.  
Detailed analysis of selected representative plays read in Russian; study of the development of this genre.

**34.251 Russian Expository Prose** (Prereq. 34.204) 4 Q.H.  
Selected readings of lectures, speeches, essays, and critical studies by outstanding Russian scholars.

**34.253 Russian Folklore** (Prereq. 34.204) 4 Q.H.  
Various genres of Russian folk literature read in Russian. Readings are supplemented with lectures and tape recordings.

**34.254 Russian Poetry** (Prereq. 34.204) 4 Q.H.  
The major works of important classical and modern poets read in Russian and analyzed.

**34.255 Pushkin's Artistic Prose** (Prereq. consent of instructor) 4 Q.H.  
Reading of Pushkin's major prose fiction in the original, accompanied by stylistic and structural analyses. Background materials and articles of criticism are consulted. Individual oral presentations by students (in English) and research papers (in English) by arrangement with instructor.

**34.256 Pushkin's Narrative Poetry** (Prereq. consent of instructor) 4 Q.H.  
Reading of Pushkin's narrative poems in the original, accompanied by the study of the author's poetic techniques and devices. The evolution of this genre is examined in the light of literary trends, influences, and controversies. Research papers on selected topics in English.

**34.290, 34.291, 34.292, 34.293 Directed Study** (each) 4 Q.H.



**34.295, 34.296, 34.297, 34.298 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Italian

*Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.*

**35.201 Elementary Italian I** 4 Q.H.  
Essentials of grammar, practice in speaking and reading, progressive acquisition of basic language skills.

**35.202 Elementary Italian II** (Prereq. 35.201) 4 Q.H.  
Continuation of grammar study and basic language skills. Reading of Italian of increasing difficulty; practice in conversation.

**35.203 Intermediate Italian I** (Prereq. 35.202) 4 Q.H.  
Continuation of grammar. Oral practice and the reading of selected texts.

**35.204 Intermediate Italian II** (Prereq. 35.203) 4 Q.H.  
Continuation of 35.203, with greater emphasis on reading.

**35.217 The Works of Dante in Translation I** 4 Q.H.  
This course will consider and analyze various aspects of the *Vita Nuova* and the first cantica of the *Divina Commedia*, the "Inferno". Bilingual texts will be used so that students with a background in Italian, and others, may refer to the original for added interest and enrichment. Classes conducted in English.

**35.218 The Works of Dante in Translation II** 4 Q.H.  
Continuation of 35.217, but may be taken separately. "Purgatorio" and "Paradiso" will be studied in detail. Bilingual texts. Classes conducted in English.

**35.227 Italian Composition and Conversation I** (Prereq. 35.204) 4 Q.H.  
Aims at perfect speaking and writing ability. The basis of work is analysis of the language, oral and written reports, and general discussions. Conducted in Italian.

**35.228 Italian Composition and Conversation II** (Prereq. 35.227) 4 Q.H.  
Continuation of 35.227, with stress on individual work, free discussions, and compositions. Conducted in Italian.

**35.231 Masterpieces of Italian Literature I** (Prereq. 35.204) 4 Q.H.  
Introductory course in Italian literature. Selected works from the *Trecento* to the eighteenth century.

**35.232 Masterpieces of Italian Literature II** (Prereq. 35.204) 4 Q.H.  
Introductory course in Italian literature. Selected works from the nineteenth and twentieth centuries.

**35.290, 35.291, 35.292, 35.293 Directed Study** (each) 4 Q.H.

**35.295, 35.296, 35.297, 35.298 Junior-Senior Honors Program** (each) 4 Q.H.  
For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Journalism

*Minimum prerequisites for all courses in Journalism are 30.113 and 30.114 or their equivalent.*

**38.101 History and Principles of Journalism** (Junior standing or consent of instructor) 4 Q.H.  
Development of American journalism from European and English beginnings. The problems

and contributions of the "Colonial Press," the Revolutionary War period, the "Party Press," the "Penny Press" and the leading contributions to early American journalism. The evolution of freedom of the press and the concurrent responsibility of the press media. Some writing required.

**38.102 History and Principles of Journalism** (Prereq. 38.101) 4 Q.H.

A continuation of 38.101 from mid-nineteenth century. America's great personal journalists and mass circulation "giants" and their contributions: Greeley, Bennett, Raymond, Dana, Grady, Nelson, Ochs, White, Medill, Pulitzer, Hearst, Scripps, Howard, McCormick, and others. The relationships of journalism to such events as the Civil War, the Spanish-American War; the unfolding principles. Some writing required.

**38.103 Fundamentals of Newswriting** (Prereq. 30.113, 30.114 or equiv.) 4 Q.H.

Functions of the editorial department and procedures in obtaining and writing news stories. Extensive practice in writing news stories.

**38.104 Fundamentals of Newswriting** (Prereq. 38.103 or consent of instructor) 4 Q.H.

Problems of reporting and news writing with written assignments in various types of spot news reporting.

**38.105 Techniques of Journalism** (Prereq. 38.104 or consent of instructor) 4 Q.H.

Advanced practice in writing news stories along with editorials, feature stories, criticisms and other assignments.

**38.106 Techniques of Journalism** (Prereq. 38.105 or consent of instructor) 4 Q.H.

Editing the news, with practice in copy editing, headline writing, and newspaper makeup.

**38.107 The Press and Society** (Prereq. 38.106 Journalism Seniors Only) 4 Q.H.

The role of the press media in American society, both conceptually and practically. Conceptually, the meaning of Freedom of the Press is explored through study and discussion of the evolving First Amendment interpretations of the U.S. Supreme Court. Practically, a study project requires each student to make an intensive analysis of an individual newspaper in the context of the particular segment of society that it serves.

**38.108 The Press and Society** (Prereq. 38.107) 4 Q.H.

The role of the press media in American society continued, with particular reference to the legal problems of libel, slander and invasion of privacy; the balance between private rights and the public's "need to know"; the ethical responsibilities of the press media. A study project involving a practical media problem is required.

**38.121 Television Newswriting** (Prereq. consent of instructor) 4 Q.H.

Techniques of writing for television news as opposed to writing for other news media. The marriage of script to various video outputs; importance of the writer-reporter in both his/her new roles as a field-producer and a writer-producer; terms and language used in the production of T.V. news shows. Actual individual production of student news shows; field trips to T.V. stations; guest lecturers from the T.V. news media.

**38.122 Television News Production** (Prereq. consent of instructor) 4 Q.H.

An in-depth study of the techniques and language used by the electronic journalist and the T.V. news producer. The student will learn how to build a T.V. news show from studying varied inputs of the broadcasting journalist utilizing sight, sound and motion derived from film, video tape, slides, photos, tape recorders and other tools used world-wide in television news production.

**38.130 Advanced Reporting** (Prereq. consent of instructor) 4 Q.H.

All over the country, increasing numbers of special teams are being utilized to handle investigative reporting. This course covers the daily press, but also delves into the techniques used by radio-T.V., the underground press, wire services, suburban weeklies, and magazines. Students participate in a selected controversial project and produce a series for publication and broadcast.

**38.135 Journalism and the Mass Media** (formerly **Public Affairs and Journalism**) 4 Q.H.

Includes a series of seminars featuring well-known professionals from major newspapers,

radio-T.V. stations, wire services, magazines, photography and public relations. An up-to-date, in-depth explanation of techniques and theories utilized in various media. Instructors include many award winners and even Pulitzer Prize recipients. Sponsored by the New England Chapter of Sigma Delta Chi, professional journalism organization to benefit its journalism scholarship program at the University. This course will be open to Journalism majors first, and then to others up to a maximum of 30.

**38.290, 38.291 Directed Study in Journalism** (each) 4 Q.H.

An independent study limited to qualified Journalism majors who are seniors. The study requires the approval of the department.

**38.295, 38.296, 38.297, 38.298 Junior-Senior Honors Program** (each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Economics

*Unless otherwise stated there are no prerequisites for advanced economics courses. Exceptions are made at the discretion of the instructor.*

**39.105 Principles of Economics** 4 Q.H.

Development of macroeconomic analysis; review of national income concepts; national income determination, fluctuation, and growth; role of the banking system and the Federal Reserve System; government expenditures and taxation; international trade; balance of international payments.

**39.106 Principles of Economics** 4 Q.H.

The role of a market pricing system, demand and supply, in determining the allocation of resources to competing uses and why this system may not function adequately in certain areas. Application of economic principles to private and public problems in such areas as pollution, poverty, and racial discrimination.

**39.115 Principles and Problems of Economics** 4 Q.H.

An introduction to the conceptual aspects of economics; the flow of national income; economic growth and fluctuation; the role of money and banking; monetary and fiscal policies. Emphasis on developing conceptual tools for use in the analysis of economic problems facing modern society.

**39.116 Principles and Problems of Economics** 4 Q.H.

Development of basic theory of demand, supply, and market price. Applications to selected microeconomic problems such as: basic economics of monopoly and competition, poverty, race and discrimination, urban affairs, pollution, and other problems which relate to the role of the pricing system in resource allocation and income distribution.

**39.130 Medical Economics** 4 Q.H.

Examination and discussion of the following topics: health care trends in the United States; causes for increases in medical care costs; supply and training of health care personnel; the nation's need for physicians, nurses, pharmacists and other allied health personnel; the quality of medical care; economics of health insurance plans; consumer demand for health care, medical facilities, professional personnel, and semi-professional personnel.

**39.140 Economics of Crime** 4 Q.H.

Theoretical and empirical analysis of the economic causes of criminal behavior will be presented. The social costs of crime and its prevention will be covered, and techniques for designing optimum law enforcement policies will be developed.

**30.150 Economics of World Energy and Primary Resources** 4 Q.H.

Investigates economic, political and historical backgrounds of the energy and other resources problems. Future impact of primary resources limitations on U.S. and world economics will be analyzed. Feasibility studies of resource substitution.

**39.155 Superpower Economics**

4 Q.H.

Will analyze the relative economic structure and strength of the U.S., U.S.S.R., Japan, and the Common Market and China, as well as the economic relations among these powers. Will also examine the impact of these relations on the domestic economies of the superpowers and of the developing nations of the world.

**39.190, 39.191 Directed Study**

(each) 4 Q.H.

Independent work under the direction of a member of the Department on a chosen topic. Limited to qualified seniors majoring in Economics, with approval of Department.

**39.250 Statistics I**

4 Q.H.

Elementary set theory, basic probability, Bayesian decision making, measurement and presentation of economic statistics, descriptive statistics, basic estimation techniques, applications.

**39.251 Statistics II**

(Prereq. 39.250) 4 Q.H.

Testing statistical hypotheses, sampling problems; analysis of variance; correlation and linear regression analysis; multivariate regression analysis.

**39.255 Microeconomic Theory**

(Prereq. 39.106, 39.116, or equiv.) 4 Q.H.

A detailed study of supply and demand analysis, various elasticity concepts and applications, theory of consumer demand, theory of production, derivation of cost curves. Detailed analysis of pricing and output behavior in the several market structures with their welfare implication; the pricing of resources.

**39.256 Macroeconomic Theory**

(Prereq. 39.105, 39.115, or equiv.) 4 Q.H.

Investigation of the conceptual and empirical problems of creating and using national accounts; price index problems; conceptual and empirical evaluation of several consumption and investment functions, and their policy implications; multiplier and accelerator models; a brief history of recent cyclical fluctuations. Theories of inflation and growth are analyzed in the light of recent economic history.

**39.259 European Economic Development**

4 Q.H.

Economic inheritance of the nineteenth-century development of capitalism and laissez-faire. The aftermath of the Industrial Revolution, European overseas expansion, the twentieth century, the world wars, the dissolution of empires, American economic conquest and European integration, the future of less developed areas in southern Europe. Environmental impact of industrialism and the implications of technological society.

**39.260 American Economic Development**

4 Q.H.

Economic development of the U.S. from the colonial period to the present; historical changes in available factors; economic institutions and technologies; special attention to preconditions of industrialism. The American Industrial Revolution, its spread and socioeconomic consequences. The Great Depression and the subsequent rise of mixed economy and welfare state; U. S. adjustments to postwar economic changes.

**39.261 Economic History of Less-Developed Countries**

4 Q.H.

The problems of initiating and sustaining growth in selected third-world countries during the last 200 years, with emphasis on traditional vs. contemporary economic development. Role of Western society; impact of technological and structural changes; relations between states and economic enterprises.

**39.262 Government Expenditures: Structure and Evaluation**

(Prereq. 39.106, 39.116, or equiv.) 4 Q.H.

Fiscal functions of government, fiscal institutions and politics, theory of social goods, public expenditure growth and structure, the federal budget expenditure evaluation and cost-benefit case studies, fiscal federalism in theory and practice.

**39.263 Financing of Government: Taxation and Debt**

(Prereq. 39.106, 39.116, or equiv.) 4 Q.H.

Principles of taxation, problems of tax structure and reform, major names at federal, state and local levels, tax burden incidence, effects of taxation on economic efficiency and growth, negative income tax and social security finance, issues of public debt, public enterprise pricing, international tax coordination, taxation in developing countries.

- 39.265 Money and Banking** (Prereq. 39.105, 39.115, or equiv.) 4 Q.H.  
The nature and function of money, credit, and monetary standards, and the role of our monetary and banking system in the economy. Topics include: commercial banking, monetary theory and policy, the role and instruments of the Federal Reserve System, and international monetary problems.
- 39.266 Government Finance** (Prereq. 39.106, 39.116, or equiv.) 4 Q.H.  
Fiscal functions, institutions, and politics; growth of the public sector; expenditure planning in theory and practice; cost-benefit analysis; principles of taxation and tax incidence; major taxes at Federal and state-local levels; fiscal policy for high employment, price stability, and growth; current fiscal problems such as tax reform, urban fiscal problems, fiscal federalism, and income maintenance programs.
- 39.267 Economics of Urban Transportation** 4 Q.H.  
Transportation and land-use patterns; externalities; social costs and social benefits of various modes of urban transportation; ownership, regulations, and financing of various modes of transportation; economies of new technology in urban transportation.
- 39.268 Urban Economics** 4 Q.H.  
An inquiry into the causes of the location and the growth of urban centers; economic analysis of selected urban problems.
- 39.269 Urban Economic Problems and Policies** 4 Q.H.  
Sequel to Urban Economics. Detailed analysis of urban problems, such as housing, transportation, land use, and public services. Exploration of public policies related to such problems.
- 39.271 Social Control of Economic Activities** 4 Q.H.  
Development of the government's role in economic activities, examining the relationship between the government and industry, labor, agriculture, public utilities, and consumers. The course will trace the changing role of the government from a laissez-faire policy to one of direct intervention in the economy. Current topics such as wage and price control, environment and anti-pollution policies, consumer protection, and conglomerate mergers will be discussed.
- 39.273 Industrial Organization and Public Policy** (Prereq. 39.255) 4 Q.H.  
The theoretical framework for analysis and evaluation of the static and dynamic performance of real markets. An examination of the empirical studies testing the usefulness of applying theory to real markets. An examination of antitrust as a public policy designed to promote better market performances.
- 39.275 Labor Economics** 4 Q.H.  
Examination of the economics of the labor market and the labor force and of the institutions and policies dealing with them; employment, unemployment, wage determination, income distribution, and the development and efficient use of labor resources; development of trade unions; collective bargaining issues and their economic consequences.
- 39.277 Economics of the Quality of Urban Environment and Control** 4 Q.H.  
Economic analysis of air, water, thermal, and noise pollution; the utilization of urban space and other urban resources; identification of possible economic effects of urban environment, such as crime, delinquency, immobility, and congestion.
- 39.278 Poverty and Discrimination** 4 Q.H.  
Analysis of trend and composition of poverty in America. Examination of labor market, demographic and institutional forces contributing to poverty; role of education; economics of race and sex discrimination; public welfare system and proposed reforms.
- 39.279 Manpower and Anti-Poverty Policies and Programs** 4 Q.H.  
Sequel to 39.278. Poverty and discrimination; assessment of government and private efforts to fight poverty and improve the labor market position of impoverished groups; relationship between causes of poverty and discrimination; and possible remedies. Manpower training programs, negative income tax, family allowances, and other income maintenance schemes.

**39.280 Comparative Economics**

4 Q.H.

Competing types of theoretical economic systems; analysis of organization and operation of currently existing types of communist, socialist, and capitalist economies; comparison and evaluation of economic behavior and performance of different economic systems.

**39.281 Introduction to Mathematical Economics**

(Prereq. 39.105, 39.115, or 39.125; and 39.106, 39.116, or 39.126; and 10.105;

calculus not required) 4 Q.H.

Functional analysis, matrix algebra, analysis of statistical economics models, derivatives, and differentiation and optimization.

**39.282 Mathematical Economics**

(Prereq. 39.281 or consent of instructor) 4 Q.H.

For economics, mathematics, business, and engineering students interested in a broad coverage of economic analysis using mathematical techniques as tools. Topics are: models of the firm, demand theory, input-output, and other planning and policy models of the national economy.

**39.285 Economic Development**

4 Q.H.

Prospects for economic growth in poor nations as indicated by economic analysis and historical experience; social, cultural, and institutional determinants of growth; implications for the international position and policies of the U.S.

**39.286 International Economics**

(Prereq. 39.106, 39.116, or equiv.) 4 Q.H.

Introduction to the theory of international trade and its role in resource allocation; implications of economic welfare; foreign exchange; the balance of payments mechanism; and problems of disequilibrium and adjustment.

**39.288 Economic Growth and Instability**

(Prereq. 39.105, 39.115, or equiv.) 4 Q.H.

Measurement and cost of economic growth and instability; long-run models and explanations of aggregate growth; short-run models and causes of fluctuations in output, employment, and prices; long-run forecasts of aggregate change; policies for optimal growth and stability.

**39.289 Advanced Economic Theory**

(Prereq. 39.255 and 39.256) 4 Q.H.

Advanced theoretical treatment of selected topics in microeconomics and macroeconomics. Recommended for students planning to take graduate economics.

**39.291 Senior Economic Seminar**

(Prereq. 39.255 and 39.256) 4 Q.H.

Course for senior Economics majors; coordinating and applying economic concepts, methodology, and data to contemporary issues and problems of broad social, economic, and philosophical importance.

**39.292 History of Economic Thought**

4 Q.H.

Comprehensive course of study in the development of economic thought. Coverage includes mercantilism as the first economic doctrine; analysis of older classical school, its later refinements (modern marginalism), and its important critics (socialists, Marxists); Keynesian and modern developments.

**39.293 Introduction to Econometrics**

(Prereq. 39.105, or 39.115, and 39.106, or 39.116, or 39.251) 4 Q.H.

The methods of econometric estimation and forecasting. Coverage includes topics in various statistical techniques. Students are given the opportunity to construct their own models and use computer facilities for estimation and forecasting.

**39.294 Problems in Economic Research**

(Prereq. 39.105, or 39.115, and 39.106, or 39.116, and 39.251) 4 Q.H.

Research methods of practicing economists with typical problems from applied areas of economics and choice of modeling framework; problems of data collection, review of estimation techniques and interpretation of results; development of static and dynamic adaptive policy models.

**39.295, 39.296, 39.297, 39.298 Junior-Senior Honors Program**

(each) 4 Q.H.

For prerequisites and other details, see the section on the Junior-Senior Honors Program on page 27.

## Accounting

### 41.111 Accounting Principles I

4 Q.H.

This first of a series of accounting courses assumes students do not possess knowledge of the subject. Both this course and 41.112 are designed to provide an understanding of accounting issues and objectives for proper interpretation and analysis of financial data. Specific topics covered in this first course are: 1) the nature, function, and environment of accounting; 2) the basic accounting model; 3) financial and analytical ratios; 4) the accounting cycle; 5) accounting for merchandising entities; and 6) the control of cash and receivables.

### 41.112 Accounting Principles II

(Prereq. 41.111) 4 Q.H.

In this, the second of a series of accounting courses, students are introduced to financial and managerial accounting decisions through class discussions, short exercises, and demonstration problems. Specific topics covered include: 1) control of inventory; 2) acquisition, depreciation, and disposal of plant and equipment; 3) paid-in capital related to sole proprietorships, partnerships, and corporations; 4) short and long term debt financing; 5) the analysis and interpretation of financial reporting; and 6) the statement of changes in financial position.

### 41.113 Accounting Principles III

(Prereq. 41.112) 4 Q.H.

An introduction to managerial accounting with emphasis placed on: 1) the accumulation of internal data for managerial analysis and control; and 2) a familiarization with general systems of data accumulation.

### 41.118 Principles of Accounting

8 Q.H.

Covers the content of courses 41.111 and 41.112. Intended for transfer students.

### 41.160 International Accounting

(Prereq. 41.112) 4 Q.H.

This course is a comparative analysis of accounting concepts and practices in other countries, and will include: the contrast between various systems; problems of accounting for international corporations, including transfer prices and income measurement; and accounting influences on economic development.

### 41.205 Cost Accounting for Management

(Prereq. 41.112) 4 Q.H.

An examination of cost accounting from a managerial viewpoint. The impact of quantitative and behavioral aspects on budgets and cost control is stressed. This course is designed specifically for management majors.

### 41.210 Introduction to Accounting - L.A.

4 Q.H.

Designed specifically for Liberal Arts majors, the objective of this course is to provide a fundamental knowledge of accounting for students who do not expect to become accountants but desire to understand, interpret, and make use of accounting data. The course surveys the foundations of accounting and the role it plays in the management of the profit and non-profit sectors of the American economy.

### 41.251 Intermediate Accounting

(Prereq. 41.112) 4 Q.H.

A comprehensive examination of the problems involved with the definition and measurement of assets, the nature of the basic financial statements, as well as the limitations of financial statements. Alternative accounting principles are examined from both theoretical and procedural viewpoints. Specific areas examined are: the basic accounting process, cash, receivables, inventory valuation, fixed assets, and intangible assets.

### 41.252 Intermediate Accounting

(Prereq. 41.251) 4 Q.H.

A discussion of alternative accounting principles relating to equities, together with an evaluation of the conflicts and shortcomings in these concepts. Specific areas examined are: contributed capital, stock rights and options, bonds payable, long-term leases, income tax allocation, and price-level accounting.

**41.254 Cost Accounting**

4 Q.H.

Budgetary planning and control, with emphasis on using cost data for decision-making.

**41.257 Auditing**

(Prereq. 41.252) 4 Q.H.

Designed to give the accounting major a thorough knowledge of auditing through: 1) the application of auditing principles and adherence to auditing standards; 2) the ethics of the profession; and 3) the significance of new audit pronouncements.

**41.260 Federal Taxes**

(Prereq. 41.112) 4 Q.H.

This course stresses basic understanding of the Federal Income Tax structure rather than professional expertise required for preparing the various tax returns. Each student is required to do three research cases directed to solving tax problems regardless of specific provisions of the current Internal Revenue Code. The course contains a thorough study of Federal taxation approaches to individuals, partnerships, and corporations.

**41.262 Accounting Theory and Practice**

(Prereq. 41.252) 4 Q.H.

Objectives are to examine: 1) the theory and practice of corporate financial reporting and some of the controversial areas in accounting; 2) the pronouncements and research studies of the authoritative institutions of the profession relating to the practice of accounting; 3) the textual and periodical literature on accounting theory.

**41.263 Accounting Planning and Control**

(Prereq. 41.254) 4 Q.H.

The purpose of this course is to introduce the student to managerial accounting at a relatively sophisticated level, with the primary emphasis on decision-making. This focus on managerial decision-making serves to integrate the accounting function with the vital role of information systems and the position of managerial accountants as important members of the management team. The course work will consist primarily of three parts: 1) case work; 2) research projects; and 3) literature review.

**41.264 Advanced Accounting Problems I**

(Prereq. 41.252) 4 Q.H.

Primarily intended for the student who plans to enter the professional field of accounting, the course provides an in-depth analysis of various accounting topics together with discussions of the various approaches to problem solving and an examination of the alternative accounting principles involved. The topics covered are: earnings per share, pensions, consignments, installment sales, estates and trusts, partnerships, and not-for-profit organizations.

**41.266 Contemporary Accounting Problems**

(Prereq. 41.252) 4 Q.H.

A seminar designed to survey some of the important problem areas currently facing the accounting profession. These areas will incorporate asset valuation, price-level adjusted statements, environmental considerations, income measurement, and governmental intervention.

**41.269 Advanced Accounting Problems II**

(Prereq. 41.252) 4 Q.H.

Intended for the student who plans to enter the professional field of accounting, the problem-solving approach is used to demonstrate the application of accounting principles. Recent pronouncements regarding the topical areas are examined. Specific areas covered are: consolidations, financial reporting by multinational corporations, and segmental reporting.

*Also see course 49.262 for Independent Study.*

## Marketing

**43.120 Introduction to Marketing**

4 Q.H.

This course consists of lectures, readings and small group discussions of the role of marketing in contemporary economic society, in the business enterprise and in the non-profit



organization. Consideration is given to the planning, operation and evaluation of marketing and promotional efforts necessary to the effective marketing of consumer and industrial products and services in both profit and non-profit organizations.

### **43.223 Communications and Advertising Management Decision-Making**

(Prereq. 43.250) 4 Q.H.

An in-depth decision-making approach to the creation, administration and evaluation of advertising and related communications programs in business and non-profit organizations. Decisions emphasized are audience/marketing selection, visual illustration and program evaluation and coordination. Decision-making on related consumer and social issues is also considered.

### **43.235 Marketing Channels**

(Prereq. 43.250 or consent of instructor) 4 Q.H.

Marketing structures and institutions; their evolution, functions, interrelationships, and the management of their role in the marketing process. Upper-class elective.

### **43.236 Retail Merchandising and Control**

(Prereq. 43.120 or consent of instructor) 4 Q.H.

An examination of the concepts and techniques of store operations and merchandise management.

### **43.237 Retail Strategies and Problems**

(Prereq. 43.120 or consent of instructor) 4 Q.H.

This course considers the major strategic and policy decisions of important retailing institutions—supermarkets, department, discount and specialty stores.

### **43.240 Marketing Research**

(Prereq. 43.251 or consent of instructor) 4 Q.H.

This course focuses on the survey research process and the analysis of data using "canned" computer programming routines. Among the topics covered are; 1) problem definition, 2) research design, 3) sampling techniques, 4) questionnaire development, 5) data collection methods, and 6) data analysis. Students will work on group projects with participating firms. No previous computer experience required.

### **43.242 Sales Management**

(Prereq. 43.250) 4 Q.H.

Creation, management, and appraisal of the sales force. Case studies and discussions, plus selected readings. Junior and senior elective.

### **43.244 Quantitative Methods in Marketing**

(Prereq. 49.251) 4 Q.H.

This course will focus on statistical methods and techniques commonly used in the analysis and interpretation of survey and experimental data. "Canned" computer programs will be used extensively to illustrate the applicability of the methods discussed. No previous computer experience required.

### **43.250 Marketing Management I**

(Required of Marketing majors) 4 Q.H.

An introduction to market analysis and the design and implementation of marketing strategies. Of primary concern is the appraisal of the environment of business and marketing activities, with particular emphasis on factors affecting the nature and extent of consumer demand. An upper-class elective prerequisite to a number of other elective Marketing courses. Open to non-Marketing majors in middler, junior, and senior years.

### **43.251 Marketing Management II**

(Prereq. 43.250) 4 Q.H.

A continuation of 43.250. Based on understanding of business and marketing environment and of consumer demand, this quarter focusses on the interrelated roles of product, price, distribution, and promotion in the development and operation of marketing programs. Upperclass elective required of Marketing middlers.

### **43.261 International Marketing**

(Prereq. 43.120) 4 Q.H.

This course is designed to familiarize the student with those aspects of marketing which are unique to international business within the framework of traditional functional areas of marketing. The focus is on the environment and the modifications of marketing concepts and practices necessitated by environmental differences. Topics include cultural dynamics in international markets, political and legal environmental constraints, educational and economic constraints, international marketing research, international marketing institutions, and marketing practices abroad.

**43.262 Advertising Management** (Prereq. 43.251 or consent of instructor) 4 Q.H.  
Advertising management through class discussions of case studies selected to illustrate means of achieving proper balance and coordination of advertising with other elements in the marketing mix. Junior and senior elective.

**43.264 Introduction to Media Marketing Management** 4 Q.H.  
This course is an overview of the role of advertising, marketing, and media managers in the selection, use, and management of advertising media; particularly television, radio, newspapers, and magazines. Emphasis is on management decision-making but includes consideration of related consumer and social issues.

**43.265 Industrial Marketing** (Prereq. 43.250 or consent of instructor) 4 Q.H.  
The marketing of products where business firms are the potential customers. Upper-class elective, open to juniors and seniors.

**43.266 Marketing in the Service Sector** (Prereq. 43.120) 4 Q.H.  
A basic treatment of methods and techniques for marketing in the service sector which includes sports, recreation, public service, banking, insurance, hotels, etc. In addition to the principles covered, a number of descriptive studies will be analyzed covering the application of such marketing principles in key service areas.

**43.271 New Product Development** (Prereq. 45.112) 4 Q.H.  
For most firms, coping with the problems of environmental change through modification of the product line is both vital and difficult. This seminar has a primary concern with the examination and analysis of the problems firms face in directing and managing their new product development activities.

**43.275 Foundations of Consumer Behavior** (Prereq. 43.120) 4 Q.H.  
This course is concerned with developing an understanding of consumer attitudes and behavior processes as the basis of the design of marketing problems. Consideration is given to economic and behavioral models of consumer behavior and to underlying behavioral theories and concepts.

**43.278 Competitive Strategy** (Prereq. 43.251) 4 Q.H.  
The capstone marketing course, a required elective for seniors majoring in Marketing. The focus is upon the formulation of marketing strategy at a policy level and its implementation in a dynamic environment.

*Also see Course 49.262 for Independent Study.*

## **Finance and Insurance**

**44.120 Introduction to Financial Activity** 4 Q.H.  
Acquaints students with the important analytical tools, theories, processes, concepts and knowledge surrounding the management of the flow of funds within the corporation. Deals with the firm's demand for capital, sources of capital, management of assets, dividend payments, and forecasting of funds needed.

**44.144 Management of Financial Institutions** (Prereq. 44.120) 4 Q.H.  
Considers the broad range of decision-making problems faced by major financial institutions, such as commercial banks, savings and investment institutions, and finance companies when viewed as competitive, profit-seeking business entities. The course considers such topical areas as the nature and scope of the capital markets confronting these institutions, specialized problems with regard to the sources and uses of funds of the financial institutions, and strategic policy planning of financial institutions.

**44.145 Financial Markets** (Prereq. 44.120) 4 Q.H.  
The objective of this course is to deepen the student's understanding of the system of financial markets. Striking a balance between description and analysis, the course will explore the demand and supply aspects of fund flow in the economy. Emphasis will be given to the nature and structure of the money and capital markets, the determination of interest rates, and the evaluation of financial performance.

**44.150 Corporate Financial Management**

(Prereq. 44.120) 4 Q.H.

Extends a student's grasp of theory and analytical tools and concepts which have general applicability in most profit- and nonprofit-seeking organizations through readings and case discussions. Such analysis is primarily concerned with the evaluation of expected benefits from invested capital in relation to its costs and availability. While techniques of economic appraisal are stressed, the course also aims to locate financial valuation within the overall structure of administrative decisions about financial resource allocation.

**44.152 Managerial Finance I**

(Prereq. 44.120) 4 Q.H.

Managerial Finance I begins an in-depth study of the management of the financial resources of economic units, principally business organizations. Concentrating on the day-to-day management of the flow of cash through the enterprise, the course covers principally working capital management and the accessibility of funds in the short term. Case analysis is used to reinforce lectures and class discussions.

**44.153 Managerial Finance II**

(Prereq. 44.152) 4 Q.H.

Managerial Finance II concentrates on the long-term sources and uses of funds with emphasis on capital budgeting techniques, financial structure, and the cost of capital. Specialized topics such as mergers and acquisitions, financial failure, and overall financial strategy and timing are also examined. Instruction is primarily through readings and cases.

**44.159 Small Business Finance**

(Prereq. 44.120) 4 Q.H.

Investigates the financial requirements of smaller businesses and the sources of funds open to them. Methods of financial control in the small business are covered, as well as requirements of financing institutions. The problem of obtaining adequate equity financing and equity sources is highlighted.

**44.160 International Financial Management**

(Prereq. 44.120) 4 Q.H.

This course considers the financial policies and practices of companies involved in multinational operations. Specific topics covered include: 1) capital budgeting; 2) capitalization policies; 3) the use of Eurocurrency and Euro-bond markets; and 4) liquidity management by the international firm.

**44.162 Risk Management**

(Prereq. 44.120) 4 Q.H.

The concept of risk as faced by the business enterprise is examined, and methods and processes of risk reduction, elimination, combination, and transfer are studied. Principal emphasis is placed on the use of insurance as a risk transfer mechanism.

**44.181 Investment Management**

(Prereq. 44.120) 4 Q.H.

This course provides the student with a broad overview of the concepts, practices, and procedures of investment management. Areas to be covered include basic security types, security market operations, security analysis—both fundamental and technical, and an introduction to portfolio management.

**44.185 Management of Financial Resources**

(Prereq. 44.120) 4 Q.H.

Focuses on the raising of the supply of funds and their allocation to long-term uses to accomplish an organization's objectives. Standard and innovative types of securities are surveyed and techniques for choosing the best mix of securities are developed. The processes by which funds are obtained are described. The determination of investment opportunities and systems for their evaluation are presented.

**44.220 Insurance and Enterprise**

(Prereq. 44.162) 4 Q.H.

An in-depth approach to the use of insurance in business enterprise, covering types of insurance used to transfer risk away from the business on a voluntary basis as well as insurance requirements imposed on the business by law. The course will also cover the aspects of rate-making, underwriting, and loss adjustment.

**44.240 Personal Finance**

4 Q.H.

(Not open to College of Business Administration students) The management of the total personal estate: budgeting, savings, insurance, investments, borrowing, taxes, Social Security, pensions, annuities, securities markets, mutual funds, and their integration.

**44.241 Personal Financial Management**

4 Q.H.

The major theme of the course is the training of personal financial managers through the development of an integrated plan for personal choices in which alternative courses of action are judged by their contribution to the attainment of the decision-maker's particular set of economic objectives. The overall personal economic plan is the consistent focus of the course and unites such diverse topics as inflation, insurance, purchasing assets, etc., in a mutually reinforcing way. The course is decision-oriented and attempts not only to expose students to alternative ways of doing things, but also to lead them toward a personal rational solution. This is done by developing techniques of estimating the success probabilities of alternative methods.

**44.275 Money and Economic Activity**

(Prereq. 44.120) 4 Q.H.

It is said: "Money is that institution which brought humanity from a primitive stage into civilization" and there is much truth in this statement. An American industrial society oriented toward general welfare and stability is also inconceivable without the help of a sound and well-organized monetary and banking system. In this spirit, the study of money and economic activity enriches the background of any student in business and finance with valuable knowledge for becoming an enlightened manager and citizen.

**44.295 The Development of the Capitalistic System**

4 Q.H.

Introduction to the arguments surrounding the nature and functioning of the American capitalistic system and capitalism in general. One school of thought accuses the system of being monopolistic, whereas another defends the system as being competitive. Around this argument, excerpts from the work of great economists are used to show the development of tools of analysis for a better understanding of western capitalistic society and its problems.

*Also see course 49.262 for Independent Study.*

## **Management**

**45.112 Business Policy**

(Prereq. 45.210) 4 Q.H.

Corporate strategy and its elements, including an analysis of the company, its resources, opportunities, environment, and decision-makers. Emphasis on decision-making and implementation of strategy while operating a company in the context of a business simulation.

**45.130 Opportunity Analysis and Venture Capital**

(Prereq. 45.212 or consent of instructor) 4 Q.H.

Concerned with the essential tasks that are performed prior to the birth of a new venture. These include: finding a suitable business opportunity or developing an idea for a product or service; analyzing the feasibility of the opportunity; development of a business plan; structuring of the venture team; seeking sources of seed capital; and formation of a venture action plan for beginning operations.

**45.160 Operations Planning and Control**

(Prereq. 45.265) 4 Q.H.

The planning and control necessary for an enterprise to respond to customer demand. Specific topics include: the design of the planning and control system, inventory planning and control, forecasting for operations planning, and operations scheduling.

**45.163 Purchasing and Materials Management**

4 Q.H.

Concerned with decisions related to the flow of materials from supplier to point of use. Special emphasis on problems related to purchasing including: negotiation, value analysis, supplier selection, etc. While greater emphasis is placed on materials management in manufacturing organizations, non-profit and non-manufacturing concerns are also included. Instructor applies latest research in field gleaned from projects sponsored by the National Association of Purchasing Management and the American Production and Inventory Control Society.

**45.209 Organization Behavior I**

4 Q.H.

Application of concepts from the behavioral sciences to an understanding of the behavior of

people in organizational settings. Focus is on systematic approaches to understanding behavior, looking at people as individuals and as members of small groups, and determining implications for management. Emphasis on the development of student skills in applying behavioral concepts to situational problems.

#### **45.210 Organizational Behavior II**

(Prereq. 45.209) 4 Q.H.

A continuation of the study of behavior in organizations. Initial focus is on leadership behavior; later analysis examines the behavior of people in larger groups and in the total organization. As a complex system, the total organization provides a backdrop for viewing the process of change. Emphasis is on developing human and conceptual skills in planning and implementing organizational change.

#### **45.212 New Venture Creation - A Career Choice**

4 Q.H.

Designed to assist students interested in small business to answer a number of important questions through a systematic analysis of their own potential for an entrepreneurial career, i.e., What is involved in starting my own business? What is my own entrepreneurial orientation and commitment? What managerial and behavioral skills do I need for achievement? How can I plan for my personal and entrepreneurial goals? Case discussions, self-assessment and goal-setting exercises, guest speakers and a student-selected project are used.

#### **45.213 Risk-Taking Analysis**

4 Q.H.

An investigation of the psychological and quantitative factors that define "risk" within a number of situations and how the perception of risk may influence the behavior of different personalities in different ways. The extensive research which has focused on casino gambling will be applied to other situations such as decision making, politics, suicide, automobile driving, and buyer behavior. Material from experimental psychology, statistics, psychoanalysis, and literature will be integrated within this investigation.

#### **45.215 Organization Structure and Process**

(Prereq. 45.209 and 45.210) 4 Q.H.

An examination of various schools of management thought, including the classical, scientific management, human relations and contingency approaches to management. This course also explores organizational concepts developed from research on organizations including: interdependence, uncertainty, coordination and differentiation-integration. Readings and research findings will be applied to case examples of complex organizations.

#### **45.216 Managerial Skills Seminar**

(Prereq. 45.209 and 45.210) 4 Q.H.

A study of the nature of managerial work focusing on three key managerial roles—interpersonal, informational, and decisional. Behavioral determinants of administrative effectiveness are examined with an emphasis on the practical implications of and personal orientations to those key managerial roles.

#### **45.217 Interpersonal Effectiveness and Small Group Management**

(Prereq. 45.209 and 45.210) 4 Q.H.

This course focuses on developing personal management skills in staff understanding, influencing, and managing small groups. Such topics as effective communications, group development and dynamics, and committee management will be explored. The nature of the influence process, including the forms and sources of interpersonal power, coalition development and management and disciplinary action will be examined in detail.

#### **45.218 Motivation and Control**

(Prereq. 45.209 and 45.210) 4 Q.H.

An extensive analysis of various theories of motivation, including Herzberg's Two-Factor Theory, Expectancy Theory, Learning Theory, Need Theory (McClelland) and Competence Motivation. Also, this course considers the behavioral implications of various systems of measuring and controlling operations. Budgetary control systems, compensation systems, performance appraisal and management-by-objectives programs will be examined in a number of complex organizations.

#### **45.250 Business and Society**

(Prereq. 45.210) 4 Q.H.

An analysis of developing external influences on the business organization—social, legal, economics, cultural, ethical, and technical. Examination of the corporation in its interactions with these forces. Focus on reconciling the strains generated by these societal factors and

their impact on the management and decision-making process.

#### **45.251 Comparative Management**

4 Q.H.

The ways in which organizational structure and management processes are shaped by the mission and objectives of the organization. Examination of different types of organizations: profit-oriented business organizations, public corporations, governmental agencies, unions, schools and universities, research laboratories, police and military organizations, hospitals, trade associations, and voluntary groups.

#### **45.258 Dynamics and Practice of Superior-Subordinate Relations**

(Prereq. 45.210 or consent of instructor) 4 Q.H.

Behavioral theory and concepts applied to the understanding and performance of the leadership function in organizational management. Various laboratory procedures used in conjunction with discussion sessions to highlight individual and group concepts in problem sensing, location, and exercises as key guides to understanding.

#### **45.263 Career Planning and Managerial Skill Assessment**

(Prereq. 45.209, 45.210 and consent of instructor) 4 Q.H.

Effective career planning and development can be viewed most profitably in the larger context of an individual's actualization process in life. On the one hand, the student explores his career with reference to personal values, interests, aspirations, sense of self-worth and managerial skills, and on the other, the realities of specific occupational and professional choices. During the course each participant provides and analyzes a wide variety of data for better insight into his career future and the specific steps leading to greater goal fulfillment. Designed for ninth- and tenth-quarter students.

#### **45.265 Production Management**

(Prereq. 49.251) 4 Q.H.

Production management is concerned with planning and controlling the use of men, materials, facilities, technology, and information to accomplish the objectives of an organization. The course provides a basic understanding of the management of the production system—its design, operation, control, evolution, and modification—to enhance managerial decision making in technical matters. Topics discussed are: design of product and process, human factors concepts, capacity considerations, man-machine systems, work measurement, wage administration, production planning, inventory management production control, and product quality management.

#### **45.267 Strategies of Organizational Changes**

(Prereq. 45.210) 4 Q.H.

This course explores the problems encountered when organizations seek or are forced to change. The change process and its impact will be examined from both the individual's and the organization's perspectives. The aim of the course is to develop analytical and interpersonal skills and insights into the change process. In addition to readings and cases, teams of students will be expected to undertake a field study of an organization during a period of change. Non-business organization will be the primary but not exclusive focus of the course.

#### **45.268 Assessment of Prospective Employees**

(Prereq. 45.272 or permission of instructor) 4 Q.H.

A variety of technical methods is presented which can significantly improve the effectiveness of personnel assessment over the typical methods presently in use. Personnel tools such as testing, interviewing, references, biographical information, etc., will be examined critically. Basic issues and procedures such as equal employment opportunity, decision strategies and the utility and evaluation of selection systems will be covered in detail.

#### **45.269 Interpersonal Relations through Transactional Analysis**

(Prereq. 45.209, 45.210) 4 Q.H.

Using a simplified behavioral vocabulary, Transactional Analysis becomes a language and way of thinking about the nature of interpersonal relations. As an applied skill, Transactional Analysis teaches one how to improve communications and relationships between individuals. Transactional Analysis has been used as a training technique by dozens of companies in such areas as improving the interpersonal skills of customer-contact

personnel, implementing affirmative action programs, and improving superior-subordinate relations.

**45.272 People and Productivity** (Prereq. 45.209) 4 Q.H.

The purpose of the course is to develop understanding of the factors which control the effectiveness of an organization. The factors are based in the relationship between its task, technology, structure, and human resources. Applications of this understanding are made to different organizational settings for purposes of increasing productivity.

**45.273 Personnel Administration** (Prereq. 45.272) 4 Q.H.

The purpose of this course is to provide knowledge of basic traditional personnel functions, with an emphasis on the role of the personnel specialist. Functions include: recruitment, selection, placement, training and development of employees, as well as reward systems such as money and promotions. The recent challenge of new regulatory systems, such as affirmative action and occupational safety and health, on employment planning will be covered.

**45.274 Contemporary Labor Issues** (Prereq. 45.209) 4 Q.H.

A study of current issues dealing with labor in its broadest sense. Deals with labor unions and manpower institutions and also the emerging development and training problems caused by unemployment, poverty, and changing work patterns. Reviews recent legislation on equal employment opportunities and extension of bargaining rights for minorities, women, and the handicapped, the aged, and migrant workers.

**45.275 Labor Law** 4 Q.H.

The purpose of this course is to acquaint the student with the many constitutional and legal problems involved in labor organizing, industrial relations, labor negotiations, labor contract enforcement, and dispute resolution, both in the private and public sectors of labor administration. Cases are studied for the legal principles underlying the common law, state and federal laws, and the constitutional questions of power and authority. Milestone legislation (e.g., Sherman Act, Clayton Act) is considered in some detail.

**45.276 Seminar in Collective Bargaining**

(Prereq. 45.272 or permission of instructor) 4 Q.H.

The organization, negotiation and administration of collective bargaining relationships between management and unions in different industries, services, and levels of government. Simulations of actual bargaining and comparative research projects are part of the course.

**45.277 Reward Systems** (Prereq. 45.272) 4 Q.H.

Study of one of the four traditional areas of personnel concerns, viz., compensation policy as part of the organization's overall reward system, with comparisons of differing needs and implementations. A survey of various direct and indirect compensation systems provides the framework for the study of compensation policy.

**45.280 Career Development I** (Prereq. 49.100) 2 Q.H.

An exploration of organizational settings in which work is performed; study of the concept of a career and of the career development process; research and analysis into kinds of work, careers, and jobs that the individual might find potentially attractive.

**45.281 Career Development II** (Prereq. 45.280) 2 Q.H.

Development of increased understanding of the individual's own personal and career needs, interests and goals, and assessment of strengths and weaknesses related to potential career alternatives.

**45.282 Career Development III** (Prereq. 45.281) 2 Q.H.

Development of self-promotional skills to enhance the student's marketability. Emphasizes interviewing techniques, job market research, the graduate school question, and resumé writing. A seminar focuses on common concerns and strategies of the senior placement process.

*Also see course 49.262 for Independent Study.*

## **International Business Administration**

### **46.100 Introduction to International Business**

4 Q.H.

A survey of the concepts of international business. This course focuses on the analysis of the cultural, economic and political aspects of domestic and foreign environments and their effect on the international operations of business firms. Topics covered include: 1) the principles, patterns and potential of international trade and investments; 2) the development of management strategies for international businesses; and 3) the organization and management of the firm's international operations.

### **46.101 Seminar in International Business**

(Prereq. 46.100) 4 Q.H.

This course applies the concepts and skills acquired in other international and domestic courses to the solution of managerial problems. It focuses on the task of solving significant managerial problems in international and foreign cultural contexts. Student reports form a major part of this course and are focused on either a functional business area related to international operations or on analyses of market opportunities and methods of entry in a foreign environment. Other instructional vehicles include case analyses and discussions of current issues.

### **46.102 Comparative International Management**

4 Q.H.

The objective of this course is to develop the conceptual and analytical abilities of the student to: 1) identify and analyze management systems in various national settings; and 2) understand the impact of economic, social, political, and cultural variables on management systems.

### **46.103 Environmental Pressures and the Multinational Corporation**

(Prereq. 45.209 and 45.210) 4 Q.H.

Rapid multidimensional change in the world environment creates substantial pressures on corporations—especially large multinationals. The purposes of this course are to identify and evaluate: 1) environmental pressures most likely to have impact in the coming decade(s); 2) planning approaches which may be useful to the manager in analyzing the changing world environment; and 3) possible corporate responses to any environmental pressures. This course is designed for both students in international business and those who have a general interest in the changing environment.

## **Transportation**

### **48.101 Principles of Transportation**

(Prereq. 39.105) 4 Q.H.

The political, social, and economic functions of transportation; development and structure of the domestic transportation system; the nature of government regulation and promotion of the several modes.

### **48.102 Current Issues in Transportation Policy**

(Prereq. 48.101) 4 Q.H.

An overview of the regulatory process and its impact on the domestic transportation system. Critical examination of topical policy issues which confront carriers, shippers, and the agencies of regulation.

### **48.103 Carrier Management**

(Prereq. 48.101) 4 Q.H.

The transportation system from the carrier's viewpoint; managerial response to a heavily regulated and rapidly expanding environment; focus on carrier decision-making involving routes, scheduling, financing, and pricing of services.

### **48.104 Physical Distribution Management**

(Prereq. 43.120) 4 Q.H.

Movement, distribution, and control of raw material and finished goods flows. Examination of the importance of inventory control, scheduling, warehousing, and transportation in the design and operation of distribution systems.

### **48.105 Urban Transportation**

(Prereq. 39.105) 4 Q.H.

Impact of private and public transport systems on urban development. The planning and



implementation of government programs concerning construction and promotion of system alternatives.

**48.106 Air Transportation** (Prereq. 48.101) 4 Q.H.

A managerial perspective on economics and regulation of commercial aviation; emphasis on routes, schedules, operations, and financing.

**48.108 Transportation Labor** (Prereq. 48.101) 4 Q.H.

This course focuses on the significance of the labor component in the transportation industries. Attention is devoted to trends in employee compensation, productivity, and bargaining patterns. Also examined are the role of government in this area and the impact of transportation labor on shippers, carriers, and consumers.

**48.110 International Transportation and Distribution Management** 4 Q.H.

This course examines the present and future status of U.S. and world ocean and air transportation in international trade and development. The economic, regulatory, financial and operating characteristics of these forms of carriage are examined with primary emphasis given to their impact on international trade patterns. Other topics include government promotion, subsidy, and technological innovation.

**48.120 Seminar in Transportation and Distribution** (Prereq. 48.102 and 48.104) 4 Q.H.

A discussion and research-oriented course which focuses on a limited number of advanced transportation and distribution topics. Interaction with business and government representatives is a major component of this course.

*Also see course 49.262 for Independent Study.*

## General Business

**49.100 Introduction to Business** 4 Q.H.

The business organization as a system of interrelated functions and operations; the interactions between the organization and its environment; and the role of management in business organizations.

**49.107 Management of Smaller Enterprises** 4 Q.H.

A general management course that focuses upon the strategies and operating problems of smaller, already established business enterprises. The course is designed for individuals who are considering entrepreneurial careers or careers in management, finance, or marketing within the smaller company environment. Discussion will explore the characteristics and urgencies of problems that smaller companies are likely to encounter at different stages in their evolving life cycle, from the post-natal period to the more mature stage.

**49.155 Legal Aspects of Business** 4 Q.H.

This course is concerned with the legal aspects of business transactions and business relationships involving contracts, the law governing sales and secured transactions under the uniform commercial code, agency relationships between parties, the law governing a bulk sale transfer, and suretyship and guaranty.

**49.206 Management Information Systems** (Prereq. 49.251) 4 Q.H.

This course focuses on the design and implementation of a computer-based management information system. This includes programming, flow diagramming, and documentation of business subsystems. A term project requirement provides experience with realistic design problems and computer applications.

**49.210 The Law of Business Organizations and Commercial Paper** (Prereq. 49.155) 4 Q.H.

This course is concerned with the legal aspects of the typical forms of business ownerships, the responsibility and liabilities involved between parties, the law governing commercial paper under the Uniform Commercial Code, and the requirements of bankruptcy proceedings. The course covers partnerships, corporations, negotiable paper and bankruptcy procedures.

**49.212 Law of Wills, Trusts and Estates**

4 Q.H.

The requirements of a valid will, claims of and against the estate and final distribution of property. The requirements of a valid inter-vivos trust, a testamentary trust, the responsibilities and liabilities of a trustee, the rights of beneficiaries, and administration of an estate, both formal and informal. Course covers types of wills, types of trusts, and administration of an estate.

**49.213 Law of Sales (Consumer goods - personal property and bailments)**

(Prereq. 49.155) 4 Q.H.

The law governing sales and secured transactions under the Uniform Commercial Code; the rights and liabilities of parties in transactions involving consumer goods, personal property and bailments. Course covers sales, secured transactions, consumer goods, personal property, and bailments.

**49.215 Bulk Sales and Bankruptcy**

4 Q.H.

In examining bulk transfers, a detailed study is made of the Uniform Commercial Code, Article 6: the need of the transferor to give to the transferee a sworn list of all his creditors; the giving of notice to the listed creditors; the contents of the notice, what creditors are protected; and the legal consequences of failure to comply with the Code. In examining bankruptcy, the course deals with both voluntary and involuntary bankrupts; the acts of bankruptcy; the appointment and duties of the trustee; provable and dischargeable debts; priority of debts; discharge and acts which bar a discharge; the definition of bankrupts and their rights and responsibilities.

**49.216 Law of Real Estate - Property, Tenancy and Insurance** (Prereq. 49.155) 4 Q.H.

The legal aspects required for a transfer of land, the leasing of property and the insurance coverage on such property, the Statute of Frauds requirements of a valid enforceable contract involving a sale of land or a sale of an interest in land. Course covers contracts involving land, contracts involving leasing, or renting of land, and property insurance on said property interests.

**49.240 Law in Society**

4 Q.H.

Acquaints the student, as a member of society, with his legal rights, obligations, and responsibilities, applicable in his relationship with others and with the state. Tort actions involving some major areas such as: assault and battery, trespass, negligence, slander, libel, and deceit as well as criminal actions involving major areas, such as homicide, assault and battery, robbery, arson, larceny, burglary, and self-defense.

**49.250 Quantitative Methods I**

(Prereq. 10.125) 4 Q.H.

Statistical description introduces a set of techniques for restructuring a data base to effectively communicate the information contained therein. Procedures are examined for drawing inferences about characteristics of a universe based on information gathered from a sample. Topics treated include: probability distributions, Bayesian revisions, estimation, and hypothesis testing.

**49.251 Quantitative Methods II**

(Prereq. 49.250) 4 Q.H.

The model is examined as an analytical device designed to aid the decision-maker. Topics covered include: Chi Square analysis, payoff tables, decision trees, simple regression and correlation and multiple regression and correlation.

**49.262 Independent Study**

4 Q.H.

For a student who has received approval of a proposal to undertake independent study in lieu of any course required in the various concentrations. Each teaching area considers proposals presented by students to its Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study will take place. A copy of the final report prepared by the student will be presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from area coordinators.

**49.263 Independent Study**

4 Q.H.

Same as 49.262

- 49.264 Independent Study** 4 Q.H.  
Same as 49.262
- 49.265 Independent Study** 4 Q.H.  
Same as 49.262

## Education Foundations

- 50.114 Education and Social Science** 4 Q.H.  
Introduction to the social scientific analysis of education and a brief exposure to the methods and thinking of these social sciences. The student should develop an orientation to and awareness of the complexity of the educational scene in America and the world today.
- 50.121 Human Development and Learning I** 4 Q.H.  
Developmental processes from prenatal life up to adolescence. Theories of learning and personality, with research and case material covering major aspects of psychological development.
- 50.131 Human Development and Learning II** 4 Q.H.  
Continuation of Human Development and Learning I. Significant aspects of adolescence; physical, social, and psychological factors as they influence adolescent behavior.
- 50.132 Creative Expression in Children** (Prereq. 50.121) 4 Q.H.  
This course is designed to explore and release the creativity of students who intend to work with children in a variety of settings; examine the potential of creative expression for interpersonal communication; relate children's creative experiences to their cognitive, emotional, and social development; and assist students to acquire experience and confidence in working with various media available for creative expression.
- 50.133 Educational Applications of Social Psychology** (Prereq. 50.121 or 50.131) 4 Q.H.  
Focus on theory and research in social psychology especially relevant to education. Areas covered are: prejudice in the classroom; the school as a setting for manifestation of authoritarian personality; attitude organization and change in an educational environment; the class and the clique as "small groups"; the expression of need for achievement in various school structures; and related topics.
- 50.134 Mental Health in Teaching** (Prereq. 50.121 or 50.131) 4 Q.H.  
Factors involved in the choice of teaching as a career, and of psychological and occupational factors which contribute to teacher happiness and dissatisfaction, adjustment, and maladjustment. Examination of these factors is a background against which to consider: 1) what teachers can do to foster healthy personalities; 2) how to deal with psychological forces in the classroom, and; 3) steps to strengthen the emotional development of the normal child.
- 50.135 Cross-Cultural Studies of Child Rearing and Education** (Prereq. 50.121 or 50.131) 4 Q.H.  
Patterns of socialization in contrasting cultures, and possible and/or demonstrated resultants in areas of personal development of concern to educators. Readings are mainly ethnographic studies of child rearing and psychological investigations of children from contrasting backgrounds.
- 50.136 Language and Cognition: Educational Implications** (Prereq. 50.121 or 50.131) 4 Q.H.  
Development of language and thought in the child: concept learning, problem solving, and language acquisition. Particular consideration given to the implications of current research and theory in these areas for educational practice.
- 50.137 Seminar in Adolescent Psychology** (Prereq. 50.131) 4 Q.H.  
An in-depth examination of the motivational, intellectual, social, and emotional development of adolescents from the end of pre-adolescence to the beginning of young adulthood. Emphasis is also on current issues such as drug use, sexual behavior, and vocational problems.

**50.138 Seminar in Human Learning and Motivation** (Prereq. 50.121 or 50.131) 4 Q.H.  
Survey and analysis of the literature on human learning and motivation. Emphasis on interaction between human learning and motivation in the developmental process and the classroom.

**50.139 Seminar in Early Childhood Development** (Prereq. 50.121) 4 Q.H.  
The theory and research regarding the cognitive, personality, and social development of children from birth to six years, with respect to their implications for early childhood education. Various existing programs examined and new directions explored.

**50.141 Measurement and Evaluation** (Prereq. 51.135) 4 Q.H.  
The fundamentals of measurement; the use of basic statistical concepts and techniques; evaluation of standardized and teacher-made tests.

**50.142 Introduction to Educational Statistics** 4 Q.H.  
Emphasizes descriptive statistics useful in the evaluation of educational and related professional activities. Topics ordinarily covered include: statistical notation, variability, probability, sampling techniques, linear regression, correlation, t-tests, and Chi-Square tests of significance. Examples of applications of these techniques will be drawn, so far as possible, from the fields for which students in the course are preparing, as this may vary from quarter to quarter.

**50.152 Comparative Education** 4 Q.H.  
Education in other nations. Relationships with the political, economic, social, and cultural milieu in Western and Eastern Europe, the Near and Far East.

**50.153 Philosophy of Education** 4 Q.H.  
Objective is to help participants examine their own purposes in relation to those of the school as an institution. Philosophical writings (on topics such as the ethics of educational intervention, the delineation of educational concepts, the educational messages of long-range speculations and utopias, and normative assumptions underlying educational policies) and the practice of education in the class are the main materials. Dialogue is the main method.

**50.154 Current Issues in American Education** 4 Q.H.  
An analysis of the variety of educational issues confronting elementary and secondary teachers. Attempts will be made to place issues in a historical context, and to expose students to a variety of educational programs in the Boston area that are palpable efforts to deal with the issues.

**50.161 Seminar in Group Process** 4 Q.H.  
A study of the structure, dynamics, and function of face-to-face groups leading to learning about goal achievement and task orientation. The course operates mainly by committee or group instrumentation. A serious student should gain an understanding of the function of informal relationships within formal organizations, the various roles within groups, peer relationships, superior-subordinate relationships, authority and intimacy, and the inclusion and exclusion processes. Also involved is the aspect of self-understanding.

**50.163 Schools as Social Systems** (Prereq. 50.114 or equiv.) 4 Q.H.  
An analysis of schools as sociocultural subsystems within the larger society. Functional interrelationship between student and school subcultures; status and role systems; and authority structures in American schools.

**50.164 Class and Ethnic Relations in Education** (Prereq. 50.114 or equiv.) 4 Q.H.  
The various ways in which the American class system and patterns of ethnic group relations have affected, and have been affected by, American education. The limitations and potential of educational institutions with respect to the resolution of intergroup conflicts and the establishment of equal educational opportunities.

**50.165 Organization and Politics of School Systems** (Prereq. 50.114 or equiv.) 4 Q.H.  
The political sociology of school systems in the U.S. An analysis of the power and authority structures in contemporary education. Who decides what and how? Who controls the system? How are the various interest groups organized? What are the mechanisms for

conflict resolution? The relationship between professional and nonprofessional interest groups.

**50.166 The Human Services Professions** (Prereq. 50.114, 21.000 or equiv.) 4 Q.H.  
This course explores what a human services agency is, how it comes into being, and how it grows and changes. Basic attitudes, values, skills, and knowledge of the human services worker are analyzed, as are the reasons why people in modern society require the assistance of human services professionals. Human services are viewed from the eyes of clients as well as society as a whole. Field work in a variety of public and private agencies is a major component of the course, as is a good deal of independent activity.

**50.167 Education and Psychosocial Development** (Prereq. 50.114 or equiv.) 4 Q.H.  
Theories and research on the socialization functions of education. The relative influence of early vs. post-childhood socialization; professional and adult socialization; the role of diverse educational experiences and institutions in personality development and change.

**50.168 Education and Social Change** (Prereq. 50.114 or equiv.) 4 Q.H.  
A sociological exploration of educational systems as independent and dependent variables in social change. Instances of planned educational change in various countries and their implications for contemporary American Society.

**50.190 Directed Study** (Permission) 4 Q.H.  
This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and the Dean's Office of the College of Education. Approval forms must be submitted to the Dean's Office during the quarter prior to registration for the Directed Study.

## Education Curriculum and Instruction

**51.124 Modern Mathematics Curricula** 4 Q.H.  
Mathematics curricula in elementary and secondary schools, including experimental programs, presented in their historical setting.

**51.126 Teaching Reading in Secondary Schools** 4 Q.H.  
For English and Social Studies majors in the College of Education who are preparing for teaching in the junior or senior high school. Basically, the same approach and organization applies to this course as to the elementary level course. (One quarter)

**51.127 Teaching Music in Elementary Schools** (Prereq. 51.135) 4 Q.H.  
An examination of the traditional Orff, Kodaly, Dalcroze, and other approaches to elementary school music. Attention will be given to children's motivations and participation in singing, listening, rhythmic, instrumental, and creative musical activities.

**51.128 Teaching Music in Secondary Schools I** (Prereq. 51.135) 4 Q.H.  
A study of divergent views and approaches to the teaching of music to early adolescents. Problems related to curricular and extra-curricular activities, including vocal and instrumental groups will be examined, with particular attention to the problems of the changing voice. Music will be studied in its relationship to other aspects of the curriculum. Opportunity will be provided to apply group and individual teaching skills.

**51.129 Teaching Music in Secondary Schools II** (Prereq. 51.135 and 51.128) 4 Q.H.  
An examination of a number of concepts, approaches, and curriculum patterns employed in the teaching of high school music. Attention will be given to music appreciation, music theory, and to vocal, instrumental, ensemble, club, and concert areas of performance. Demonstration skills required to teach in high school programs will be developed.

**51.131 Fundamentals of Arithmetic I** 4 Q.H.  
Techniques of teaching arithmetic so that underlying principles are stressed. Topics are selected to serve as a foundation in mathematics appropriate for any elementary program. Deductive and inductive reasoning, numeration systems, elementary concepts of set theory,

whole numbers and rational numbers and their properties, decimal numerals, linear equations, and inequalities.

#### **51.132 Fundamentals of Arithmetic II**

(Prereq. 51.131) 4 Q.H.

Continuation of Fundamentals of Arithmetic I. Rate, ratio and percent, informal geometry, elementary theorems and proofs, similarity and trigonometry, area of volume, elements of spherical geometry.

#### **51.133 Fundamentals of Reading I**

6 Q.H.

The basic, introductory course in developmental reading for prospective elementary teachers. In the first term, the emphasis is on language and symbolic process as it relates to beginning reading. The word recognition and meanings growth areas are studied in detail, as are some methods and techniques of testing and grouping. An introduction to some reading books and materials, methods of teaching, and the psychology of learning to read. Tutorial work begins with students.

#### **51.134 Fundamentals of Reading II**

(Prereq. 51.133) 6 Q.H.

A continuation and extension of the first term. Study skills; speed and fluency growth areas. The tutorial work is extended and greater familiarity with books, materials, and methods achieved.

#### **51.135 Analysis of Teaching and Educational Process**

(Prereq. 50.131) 4 Q.H.

The relationships that exist between instructional objectives and teaching behavior; applications of human development and learning concepts as they relate to subsequent specialized teaching methods and materials. Research results and promising theory are used to extend the prospective teacher's concepts of the teaching function.

#### **51.137 Remedial Reading**

(Prereq. 51.134) 4 Q.H.

For prospective teachers in the primary unit. This introductory course familiarizes the student with some of the most commonly known reading problems in the typical classroom as well as in the reading clinic; analysis and evaluation of the typical diagnoses of such problems; corrective programs. Tutorial work with a retarded reader, with each student keeping a log or journal of his work with a particular reading problem.

#### **51.138 Linguistics and Reading**

(Prereq. 51.134) 4 Q.H.

For elementary level teachers (primary unit). The major objective is to translate the knowledge gathered from structural and descriptive linguistics into useful classroom instruction, which includes not only reading instruction, but basic instruction in the related language skills. The contributions, particularly of such writers as Fries, Barnhart, Bloomfield, and LeFevre, are experimented with and analyzed.

#### **51.139 Writing and the Teaching of Writing**

(Prereq. 51.135) 4 Q.H.

A study of the logical and rhetorical bases of exposition and argumentative writing; the role of definition in exposition and argumentation; relationships of assumptions, assertions, and implications; the nature of proof in the sciences, social sciences, and the humanities; strategies of argumentation; the affective consequences of word choice and sentence structure.

#### **51.140 Methods and Materials of Teaching Modern Languages I** (Prereq. 51.135) 4 Q.H.

The most effective types of classroom activities, subject unit organization, assignments, examinations, and teaching aids used in modern language. The role of the language laboratory with its problems of selecting equipment, scheduling pupils, planning tapes and content of drill exercises, evaluating results, and coordinating its functions with conventional classroom instruction.

#### **51.141 Elementary Education Compendium I**

(Prereq. 51.135) 4 Q.H.

The curriculum is analyzed on the basis of the overall objectives of the American elementary school. Students evaluate and organize units of work which are appropriate to the level at which they plan to teach. The integrated approach to learning is emphasized, but the integrated approach to science, social studies, and language arts subjects is given special attention.

**51.142 Elementary Education Compendium II**

(Prereq. 51.141) 4 Q.H.

The objectives, activities, and methods of evaluation in the elementary school are continued, with special attention to the areas of music, art, and physical education.

**51.143 Methods and Materials of Teaching English**

(Prereq. 51.135) 4 Q.H.

An introduction to the structure and functions of language as they apply to the teaching of English; curriculum and planning in English. The unit approach; specific techniques of teaching reading and literature, grammar and usage, written and oral composition, listening, spelling, vocabulary, and the use of mass media.

**51.144 Methods and Materials of Teaching Modern Languages II**

(Prereq. 51.140) 4 Q.H.

Continuation of Methods and Materials of Teaching Modern Languages I.

**51.145 Methods and Materials of Teaching Mathematics**

(Prereq. 51.135) 4 Q.H.

Theory and practice of teaching secondary mathematics, including a discussion and evaluation of instructional problems. Lesson planning and presentations by individual students afford appropriate practice and serve as the medium of instruction.

**51.147 Methods and Materials of Teaching the Sciences**

(Prereq. 51.135) 4 Q.H.

The prospective science teacher is introduced to the following: the philosophies of science and their applicability in society and the secondary school; science curriculum development and application; and pertinent methods and materials in science education.

**51.149 Methods and Materials of Teaching Social Studies**

(Prereq. 51.135) 8 Q.H.

A field-oriented course conducted off campus in one or more schools of cooperating public school systems where College of Education students work with pupils individually and in small groups. Techniques of planning, development of curriculum materials, utilization of audio-visual equipment, simulations, development and implementation of evaluation instruments, presentation of original materials in class.

**51.151 Student Teaching and Seminar**

(Prereq. Formal acceptance into and completion of Advanced Professional sequence with minimum 2.0 Q.P.A., both overall and in teaching major) 8 Q.H.

Full-time participation in a university-arranged and supervised school program designed to provide opportunity for the analysis of learning and teaching and for the demonstration, evaluation, and development of teaching skills.

**51.152 Children's Literature**

(Prereq. 51.134) 4 Q.H.

For prospective teachers in the primary unit. A comprehensive survey and critical analysis of the books and materials available for basic reading instruction and for supplementary reading activities. After a massive review of the available literature for the children, especially in grades K-3, each student is responsible for developing some material of his own for trial with subjects. The ultimate goal is to make the student aware of what is available and how to use it most effectively in a reading program.

**51.190 Directed Study I**

(Prereq. Permission) 4 Q.H.

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and of the Dean's Office of the College of Education. Approval forms must be submitted to the Dean's Office during the quarter prior to registration for the Directed Study.

**51.191 Directed Study II**

(Prereq. 51.190) 4 Q.H.

For students who have completed 51.190, Directed Study I. The preparation for this course is the same as that for the Directed Study I course.

## **Education—Speech and Hearing**

**55.122 Introduction to Speech and Hearing**

4 Q.H.

An overview of disorders of speech and hearing and their treatment. A review of normal speech and hearing development.

- 55.123 Speech Science** (Prereq. 55.122) 4 Q.H.  
An understanding of the basic sciences involved in speech and audition. An in-depth study of the analysis of sound and the acoustic composition of speech. Emphasis is placed upon a review of the current theory and research in speech reception, perception, and production.
- 55.125 Anatomy/Physiology Auditory Mechanisms** (Prereq. 55.122) 4 Q.H.  
In-depth study of the normal ear structure as well as its abnormalities and pathologies. Basic principles of the psychophysics of audition will be discussed.
- 55.126 Anatomy and Physiology of Vocal Mechanisms** (Prereq. 55.122) 4 Q.H.  
An in-depth study of the static structures, musculature, and physiology of the speech mechanism. Current research in speech physiology will be emphasized.
- 55.131 Developmental Semantics and Syntax** (Prereq. 55.122) 4 Q.H.  
An analysis of the emerging semantic and syntax aspects of language in normal and atypical children. Discussion of current theory and research in language acquisition will be stressed.
- 55.133 Phonetics and Developmental Phonology** (Prereq. 55.123) 4 Q.H.  
A basic training in auditory recognition and symbolization of phonemes and allophones in major American dialects. Static and dynamic articulatory descriptions will be stressed. A review of the developmental sequence of phonemic acquisition.
- 55.141 Phonemic Disorders** (Prereq. 55.126, 55.131, and 55.133) 4 Q.H.  
A practical and theoretical understanding of the etiology of phonemic disorders; diagnostic tools for evaluation and methods of treatment.
- 55.142 Introduction to Audiology** (Prereq. 55.123) 4 Q.H.  
The basic techniques of audiometric testing and hearing conservation. A review of basic hearing sciences included.
- 55.143 Diagnostic Techniques** (Prereq. 55.126, 55.133) 4 Q.H.  
A presentation and review of diagnostic tests and procedures in speech pathology. Emphasis on the parent interview, the oral examination, and the appraisal of phonemic, phonatory, language, fluency, and auditory disorders.
- 55.144 Orientation to Clinical Practices** (Prereq. Senior status) 4 Q.H.  
Designed to introduce the student to the workings of the Hearing, Language and Speech Center. The student will be exposed, through direct observation, to the interpersonal aspects of communication in therapeutic relationships.
- 55.154 Fluency Disorders** (Prereq. 55.126) 4 Q.H.  
Stresses the nature, theories, and treatment of fluency disorders.
- 55.155 Clinical Practice and Seminar** (Prereq. 55.144) 8 Q.H.  
Provides the student with his initial involvement in the clinician-client relationship.
- 55.160 Directed Study** (Prereq. Permission) 4 Q.H.  
This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and the Dean's Office of the College of Education. Approval forms must be submitted to the Dean's Office during the quarter prior to registration for the Directed Study.

## Education—Special Education and Rehabilitation

- 56.120 Introduction to Special Education** 4 Q.H.  
A survey of the characteristics and the social, emotional, and educational adjustment of special needs individuals. The effects of attitudes of society, the attitude of the individual toward his handicap, and the effect of the handicap itself are evaluated. Current legislation will be reviewed.
- 56.121 Introduction to Learning Disabilities** (Prereq. 56.120) 4 Q.H.  
This course surveys behavioral characteristics of children who present specific deficits in



perceptual, integrative, or expressive processes which impair learning efficiency. Competencies will be developed in diagnostics, and use of curriculum materials and teaching methods.

**56.124 Diagnostics in Special Education**

(Prereq. 56.120, 56.121, 56.130 or Senior status) 4 Q.H.

Competencies will be developed in the following areas: 1) observation, recordings, and analysis of children's behavior and learning environments, including continuous measurement and informal assessment of specific, general and, behavioral learning needs; 2) techniques of formal assessment of general, specific, and behavioral learning needs.

**56.126 Methods and Materials of Teaching in Special Education**

(Prereq. 56.120, 56.121, 56.124 or Senior status) 4 Q.H.

Competencies will be developed in the following areas: 1) development and implementation of individualized educational plans, including task analysis, adaptation and selection of materials, strategies in applied classroom management techniques and; 2) adaptation and selection of materials and strategies in language arts, mathematics, and perceptual-motor skills.

**56.130 Introduction to Emotional Disturbances in Children**

(Prereq. 56.120, 19.201 or equiv.) 4 Q.H.

Review of emotional processes which interfere with learning behavior and a study of approaches used to deal with behavioral disorders. Emphasis will be on classroom management techniques, use of consultation, and parent-teacher interaction.

**56.135 Socio-Psycho Dynamics of Family Life**

(Prereq. 56.120, 56.130 or Senior status) 4 Q.H.

An introduction to and survey of the internal and external dynamics of family life. The significance of such dynamics to the mental health of the special needs child will be examined. The approaches to working with parents and the school-home interrelationships as well as the effects of disability on the family will be explored.

**56.140 Psychology of the Mentally Retarded**

(Prereq. 56.120) 4 Q.H.

Analysis of the etiology, nature, and needs of the retarded individual emphasizing cognitive and psychosocial development. Implications of these characteristics for life span management are explored in conjunction with parental and community attitudes and involvement.

**56.150 Introduction to Rehabilitation**

4 Q.H.

Overview of and orientation to the field of rehabilitation, including its historical development, psychological implications, and sociological dimensions. Special attention will be paid to rehabilitation of specific disability groups such as the physically disabled, emotionally disturbed, mentally retarded, alcoholic, drug dependent, and public offender.

**56.190 Directed Study**

(Prereq. Permission) 4 Q.H.

This experience is provided for the student whose unique academic needs or interests cannot be adequately satisfied in any of the scheduled courses of the Department. *Preparation:* Approval of the supervising faculty member and of the Dean's Office of the College of Education. Approval forms must be submitted to the Dean's Office during the quarter prior to registration for the Directed Study.

**93.230 Field Experience in Human Services I**

(Prereq. Junior status, permission only) 4 Q.H.

A university-arranged placement in an agency appropriate to the student's concentration. Opportunity is provided to integrate the field experience and academic studies under supervision of a university faculty member.

**93.231 Field Experience in Human Services II**

(Prereq. 93.230 and Senior status, permission only) 4 Q.H.

Continuation of 93.230.

## Physical Education

- 62.10A Beginning Swimming** 1 Q.H.\*  
Instruction in basic swimming skills, with emphasis on personal water safety.
- 62.10B Intermediate Swimming** (Prereq. 62.10A or equiv.) 1 Q.H.\*  
Instruction in basic and advanced swimming skills, with emphasis on form and efficiency.
- 62.10C Advanced Swimming** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in advanced swimming skills, with emphasis on form and efficiency.
- 62.10D Diving** (Prereq. 62.10A or equiv.) 1 Q.H.\*  
Instruction in basic one-meter and three-meter springboard diving in all five categories of dives.
- 62.10E Competitive Swimming** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in the four competitive strokes, starts, and turns, with emphasis on speed and conditioning.
- 62.10G Water Polo** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in beginning water polo, with emphasis on personal skill, offensive and defensive team play.
- 62.10J Survey of Aquatic Activities** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Competitive swimming, diving, skin diving, synchronized swimming, and water polo, with emphasis on recreational values.
- 62.10K Senior Life Saving** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in Red Cross life-saving skills, or techniques and theory. Red Cross Certification possible.
- 62.10L Water Safety Instruction** (Prereq. 62.10B, 62.10K) 1 Q.H.\*  
Instruction in techniques, theory and teaching methods in swimming and life-saving courses. Red Cross Certification possible.
- 62.10M Beginning Scuba** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in basic skin diving and scuba diving skills, with emphasis on personal safety.
- 62.10P Canoeing** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in basic canoeing skills.
- 62.10Q Sailing** (Prereq. 62.10B or equiv.) 1 Q.H.\*  
Instruction in rowing and basic sailing skills.
- 62.10R Small Crafts** 1 Q.H.  
Introduction to basic skills in boating, canoeing and sailing.
- 62.12A Beginning Folk and Square Dance** 1 Q.H.\*  
Introduction to folk and square dance at the beginning and intermediate levels.
- 62.12B Intermediate Folk and Square Dance** (Prereq. 62.12A or equiv.) 1 Q.H.\*  
Instruction in folk and square dance at the intermediate and advanced level.
- 62.12C Ethnic Dance Forms** (Prereq. 62.12A or consent of instructor) 1 Q.H.\*  
A study of primitive, folk, and national dance forms.
- 62.12E Modern Dance I** 1 Q.H.\*  
Introduction to modern dance technique and improvisation.
- 62.12F Modern Dance II** (Prereq. 62.12E or equiv.) 1 Q.H.\*  
A continuation of 62.12E with progression to more complex modern dance techniques and movement combinations. Practice in the use of improvisation for exploring dance movement.
- 62.12G Modern Dance III** (Prereq. 62.12F or equiv.) 1 Q.H.\*  
A continuation of 62.12F. Progression into the expressive and choreographic use of modern dance techniques.

- 62.12H Ballet I** 1 Q.H.\*  
Introduction to the fundamentals of Classical Ballet; its vocabulary, structure, placement, and style.
- 62.12J Ballet II** (Prereq. 62.12H or equiv.) 1 Q.H.\*  
A continuation of 62.12H. Progression into the expressive and choreographic use of classic ballet techniques.
- 62.12K Ballet III** (Prereq. 62.12S) 1 Q.H.\*  
A continuation of 62.12J with an in-depth study of complicated variations derived from the classical ballet technique.
- 62.12L Jazz Dance I** 1 Q.H.\*  
Exploring the basics of jazz dance techniques through the rhythmic, lyrical, and rock jazz styles.
- 62.12M Jazz Dance II** (Prereq. 62.12L or equiv.) 1 Q.H.\*  
An in-depth exploration of the lyrical jazz dance style. Technique evolved by Luigi.
- 62.12N Jazz Dance III** (Prereq. 62.12M or equiv.) 1 Q.H.\*  
A continuation of 62.12M and progression into the choreographic process of jazz dance.
- 62.12R Ballroom Dance** 1 Q.H.\*  
An introduction to traditional and contemporary ballroom dance.
- 62.12S Dance Improvisation** (Prereq. 62.12E, 62.12H or 62.12L) 1 Q.H.\*  
An exploration of the communicative potential of movement through experience and practice in dance improvisation. Analysis of physical components of movement, i.e., space, force and time. Practice in the development of dance phrases and short dance studies.
- 62.13P Beginning Gymnastics Orientation** 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in the orientation skills of tumbling, trampoline, and vaulting at the beginning level. Coed.
- 62.13Q Beginning Men's Apparatus** (Prereq. 62.13P or equiv.) 1 Q.H.\*  
Development of knowledge and skill for competent performance at the beginning level pommel horse, parallel bars, horizontal bars, and rings.
- 62.13R Beginning Women's Floor Exercise and Apparatus** (Prereq. 62.13P or equiv.) 1 Q.H.\*  
Development of knowledge and skill for competent performance in floor exercise, and beginning bars and uneven parallel bars.
- 62.13S Intermediate/Advanced Women's Gymnastics** (Prereq. 62.13P, 62.13R, or equiv.) 1 Q.H.\*  
Development of skill and knowledge of the four women's competitive areas of gymnastics for a combined performance level of 9.0 for intermediate and 12.0 for advanced credit. These scores are based on the F.I.G. Code of Points.
- 62.13T Intermediate/Advanced Men's Gymnastics (A)** 1 Q.H.\*  
Development of skill and knowledge of the six men's competitive areas of gymnastics for a combined performance level of 12.0 for intermediate and 15.0 for advanced credit. These scores are based on the F.I.G. Code of Points.
- 62.13U Intermediate/Advanced Men's Gymnastics (B)** 1 Q.H.\*  
Designed to further develop the skills and knowledge in the six areas of men's competitive gymnastics at the intermediate and advanced level. Based on the F.I.G. Code of Points.
- 62.14A Beginning Badminton** 1 Q.H.\*  
Instruction in beginning badminton skills, rules, strategy, and care of equipment.
- 62.14B Beginning Squash Racquets** 1 Q.H.\*  
Introduction to squash racquets at the beginning level; development of skills, rules, strategy, and etiquette.

- 62.14C Beginning Tennis** 1 Q.H.\*  
Instruction in beginning tennis skills, rules, strategy, and care of equipment.
- 62.14D Indoor Tennis** 1 Q.H.\*  
Introduction to tennis at the beginning level through the use of paddles and racquets in modified game situations; development of skill, rules, strategy, and etiquette. (Does not fulfill skill requirement in Physical Education major curriculum.)
- 62.14E Intermediate/Advanced Badminton** (Prereq. 62.14A or equiv.) 1 Q.H.\*  
Instruction in badminton, including intermediate and advanced skills, with emphasis on singles and doubles match play and strategy.
- 62.14G Intermediate/Advanced Tennis** (Prereq. 62.14C or equiv.) 1 Q.H.\*  
Instruction in tennis, including intermediate and advanced skills, with emphasis on singles and doubles match play and strategy.
- 62.15A Fundamentals of Movement** 1 Q.H.\*  
Understanding and performance of basic motor and sports. Efficient and effective movement for sports activities and daily living is stressed.
- 62.15B Beginning Archery** 1 Q.H.\*  
Selected skills in target shooting and practical experience in archery games, novelty events, and conduct of tournaments.
- 62.15D Beginning Bowling** 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in bowling at the beginning level. Practice provided in nearby commercial alleys. Lab fee.
- 62.15F Beginning Golf** 1 Q.H.\*  
Instruction in fundamental golf skills, knowledge of clubs and their uses, and rules and etiquette. Indoor only during winter season.
- 62.15G Intermediate/Advanced Golf** (Prereq. 62.15F or equiv.) 1 Q.H.\*  
Instruction in golf at the intermediate-advanced level. Emphasis is placed on course play, rules, and selection of equipment. Lab fee.
- 62.15H Beginning Judo** 1 Q.H.\*  
A survey of the principles and fundamental skills of judo. Instruction is geared to the beginning and intermediate levels.
- 62.15J Beginning Boxing** 1 Q.H.\*  
Instruction in boxing at the beginning level; emphasis on offensive and defensive techniques, scoring, training, and officiating.
- 62.15K Beginning Wrestling** 1 Q.H.\*  
Beginning level of instruction in basic wrestling maneuvers. Stress on fundamental breakdowns, escapes, takedown, rides, and pinning combinations. Rules and scoring procedures discussed and modified matches conducted.
- 62.15L Intermediate/Advanced Wrestling** (Prereq. 62.15K or equiv.) 1 Q.H.\*  
Intermediate-advanced levels of instruction presented. Emphasis is placed on training and training principles; selected skills not covered in beginning wrestling, scrimmages, and officiating.
- 62.15M Beginning Fencing** 1 Q.H.\*  
Instruction in basic foil fencing, including introduction to competition.
- 62.15N Intermediate/Advanced Foil Fencing** (Prereq. 62.15M or equiv.) 1 Q.H.\*  
Instruction in intermediate-advanced techniques of foil fencing, with special emphasis on competition, judging, and the use of electrical equipment.
- 62.16B Weight Training** 1 Q.H.\*  
Introduction to the principles and use of resistive exercises; isotonic exercise (weights), isometric, and the appropriateness of each.
- 62.16C Physical Conditioning** 1 Q.H.\*  
Assessment of physical fitness and body composition. Instruction in training techniques.

\*Including lab.

Special emphasis on personal exercise and dietary needs.

**62.16E Adapted Physical Education I** (Prereq. Medical consent) 1 Q.H.\*

A course designed for students whose physical activity program must be modified for medical reasons. Personalized instruction and programs are provided according to individual needs.

**62.16G Principles of Physical Activities and Conditioning** 2 Q.H.\*

Survey of the physiological principles, concepts, and applications of skills concerned with individual or group fitness programs. (Not open to Physical Education majors.)

**62.16I Beginning Cross-Country Skiing** 1 Q.H.\*

Instruction in the fundamental techniques of cross-country skiing. Lab fee.

**62.16J Beginning Skiing and Winter Sports** 2 Q.H.\*

Instruction in fundamental techniques of skiing, skating, and tobogganing. Lab fee.

**62.16K Intermediate/Advanced Skiing and Winter Sports**

(Prereq. 62.16J or equiv.) 2 Q.H.\*

Instruction in skiing and skating at the intermediate-advanced level. Emphasis placed on skills, teaching, techniques, and safety procedures. Lab fee.

**62.16L Beginning Track and Field** 1 Q.H.\*

Instruction in the fundamental skills in the various track and field events.

**62.16M Intermediate/Advanced Track and Field** (Prereq. 62.16L or equiv.) 1 Q.H.\*

Instruction in intermediate-advanced techniques in track and field events. Emphasis is placed on improvement of individual skills; techniques of officiating are discussed.

**62.16N Intermediate Cross-Country Skiing** (Prereq. 62.16I) 1 Q.H.\*

Instruction in skiing and skating at the intermediate-advanced level. Emphasis placed on skills, teaching, techniques, and safety procedures. Lab fee.

**62.16P Beginning Handball** 1 Q.H.\*

Development of knowledge and skills necessary for competent performance in handball at the beginning level.

**62.16Q Intermediate/Advanced Handball** (Prereq. 62.16P or equiv.) 1 Q.H.\*

Development of knowledge and skills necessary for competent performance in handball at the intermediate to advanced levels.

**62.17C Beginning Basketball** 1 Q.H.\*

Development of knowledge and skills necessary for performance in basketball at the beginning level.

**62.17D Intermediate/Advanced Basketball** (Prereq. 62.17C or equiv.) 1 Q.H.\*

Development of knowledge and skills necessary for performance in basketball at the intermediate to advanced levels.

**62.17J Beginning Volleyball** 1 Q.H.\*

Development of knowledge and skill for performance in volleyball at the beginning level.

**62.17K Intermediate/Advanced Volleyball** (Prereq. 62.17J or equiv.) 1 Q.H.\*

Development of knowledge and skill for performance in volleyball at the intermediate to advanced levels.

**62.17L Beginning Field Hockey** 1 Q.H.\*

Development of knowledge and skill for competent performance in field hockey at the beginning level.

**62.17M Intermediate Field Hockey** (Prereq. 62.17L or equiv.) 1 Q.H.\*

Development of knowledge and skill for competent performance in field hockey at the intermediate to advanced levels.

**62.17N Flag Football** 1 Q.H.\*

Development of fundamentals of football through noncontact work at the beginning level. Position play, passing, catching, running.

- 62.17P Beginning Football** 1 Q.H.\*  
Development of fundamental football skills and knowledge to the beginning level of competence.
- 62.17Q Intermediate/Advanced Football** (Prereq. 62.17P or equiv.) 1 Q.H.\*  
Development of football knowledge and skill necessary for competent performance in football at the intermediate to advanced levels.
- 62.18C Beginning Softball** 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in softball at the beginning level.
- 62.18D Intermediate/Advanced Softball** (Prereq. 62.18C) 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in softball at the intermediate to advanced level.
- 62.18E Baseball** (Prereq. 62.18C or equiv.) 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in baseball at the intermediate to advanced levels.
- 62.18G Beginning Lacrosse** 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in lacrosse at the beginning level.
- 62.18H Intermediate/Advanced Lacrosse** (Prereq. 62.18G or equiv.) 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in lacrosse at the intermediate to advanced levels.
- 62.18J Beginning Lacrosse** 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in lacrosse at the beginning level.
- 62.18K Intermediate/Advanced Lacrosse** (Prereq. 62.18J or equiv.) 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in lacrosse at the intermediate to advanced levels.
- 62.18M Beginning Soccer** 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in soccer at the beginning level.
- 62.18N Intermediate/Advanced Soccer** (Prereq. 62.18M or equiv.) 1 Q.H.\*  
Development of knowledge and skill necessary for competent performance in soccer at the intermediate to advanced levels.
- 62.18T Selected Field Sports** 1 Q.H.\*  
Development of knowledge and skill in speedball, speedaway, and flag football.
- 62.18V Selected Field Sports** 1 Q.H.\*  
Development of knowledge and skill in speedball and speedaway.
- 62.19A Early Childhood Motor Skill Development** 2 Q.H.\*  
A study of the development of fundamental motor patterns (run, catch, kick, strike, jump, throw) from age 0 to 10 years, including perceptual motor organizations of vision, audition, and proprioception.
- 62.19B Games and Activities for Children** 2 Q.H.\*  
Introduction to simple ball games, running and tag games, self-testing activities, movement exploration, and rhythms appropriate for children. Course content appropriate for future parents, teachers, and youth leaders.
- 62.19D The Spectator and Sports (Pass/Fail)** 1 Q.H.\*  
Instruction in the understanding for enjoyment as a spectator of such sports as football, basketball, ice hockey.
- 62.19G Perceptual Motor Training Programs** 1 Q.H.\*  
An introduction to the role motor activities play in enhancing perceptual development. An

examination of some current training programs: Frostig, Kephart, Doman-Delacato, Winter-Haven.

**62.201 Human Movement** 4 Q.H.\*  
An introduction to the nature and role of human movement and the analysis of skillful movement performance through participation and observation. Introduction to the objectives, literature, and organization of the profession of physical education.

**62.203 Group Dynamics** 4 Q.H.  
An introduction to group dynamics through selected activities, discussion, living and working together. As this is an experiential course, a resident living experience for one week at the Warren Center is an integral part of the course.

**62.204 Psychology of Sport** (Prereq. consent of instructor) 2 Q.H.  
The psychological analysis of behavioral patterns and interactions in individual and team sports; includes personality and motivation, competition and sportsmanship, the role of spectators.

**62.206 First Aid** 2 Q.H.\*  
First Aid procedures recommended for the home, school, and community. Emphasis on practices endorsed by the American Red Cross.

**62.208 Sociology of Sport and Dance** (Prereq. consent of instructor) 2 Q.H.  
The study of sport and dance as a social institution, including theories explaining the role of each in contemporary society, and the part of each in evolving societies.

**62.210 History and Philosophy of Physical Education** 4 Q.H.  
A survey of physical education from ancient times to the present. The influence of major philosophical positions upon the nature of physical education programs is also analyzed.

**62.212 Theory of Coaching** (Prereq. consent of instructor) 2 Q.H.  
An analysis of learning principles, sociology, and psychology as applied to the coaching of individual, dual, and team sports. Techniques and standards of squad recruitment, organization, leadership, and coaching ethics are presented.

**62.215 Observation of Student Behavior** 2 Q.H.\*  
The growth and development of elementary children and adolescents in physical education through direct observations and laboratory work with children.

**62.217 Theory of Play** 2 Q.H.  
The nature of play and a study of cross-cultural patterns of play. An investigation of selected theories of play, including Huizinga, Caillois, Sutton-Smith, and Lee.

**62.218 Elementary School Activities I** (Prereq. 50.121) 4 Q.H.\*  
The development of knowledge and skill beyond the advanced/beginning level in the following activities for elementary school children: dance, gymnastics, movement education, low-organization games, lead-up games, and aquatics. Analysis of elementary school children's performance and appropriate teaching techniques for the elementary school are observed and applied through observations and laboratory experience.

**62.221 Perceptual-Motor Learning and Development** (Prereq. 50.121) 3 Q.H.  
Interrelationships of movement behavior and perceptual-motor organizations of vision, audition, proprioception, and psycho-social effects of perception. A brief overview of major theories of learning as they apply to learning motor skills.

**62.24A Coaching Competitive Swimming** (Prereq. 62.10B or consent of instructor) 2 Q.H.\*  
Instruction in the techniques, theory, and coaching methods of competitive swimming and diving.

**62.24B Swimming Analysis** (Prereq. 62.10B or consent of instructor) 2 Q.H.\*  
Instruction in theory, analysis techniques, and teaching methods in swimming.

**62.24C Smallcraft Analysis**

(Prereq. 62.10Q) 2 Q.H.\*

Instruction in techniques, theory, and teaching methods of small craft classes. Red Cross certification possible.

**62.24E Analysis and Coaching of Men's Gymnastics**

(Prereq. 62.13T) 2 Q.H.\*

Skill analysis and coaching of men's gymnastics, with emphasis on appropriate teaching methods, new trends, and judging.

**62.24F Analysis and Coaching of Women's Gymnastics**

(Prereq. 62.13S) 2 Q.H.\*

Skill analysis and coaching of women's gymnastics, with emphasis on appropriate teaching methods and new trends.

**62.24G Advanced Analysis and Judging of Women's Gymnastics**

(Prereq. 62.13P or 62.13R) 2 Q.H.\*

Advanced skill analysis techniques and instruction in judging women's gymnastics leading toward a judging certification.

**62.24H Analysis and Coaching of Badminton**

(Prereq. 62.14E) 2 Q.H.\*

Analysis of performance and methods of teaching and coaching in badminton.

**62.24J Analysis and Coaching of Tennis**

(Prereq. 62.14G) 2 Q.H.\*

Analysis of performance and methods of teaching and coaching in tennis.

**62.24K Analysis and Coaching of Fencing**

(Prereq. 62.15N or 62.15P) 2 Q.H.\*

Advanced skill analysis and coaching of fencing. Special emphasis on current research and teaching methods of fencing.

**62.24L Analysis and Coaching of Golf**

(Prereq. 62.15G or equiv.) 2 Q.H.\*

Advanced skill analysis and coaching of golf. Special emphasis on course play and teaching methods. Lab fee.

**62.24M Analysis and Coaching of Track and Field**

(Prereq. 62.16M or equiv.) 2 Q.H.\*

Advanced skill analysis and coaching of all track and field skills. Special emphasis placed on the analysis of common movement patterns, teaching methods, and coaching techniques for the individual performer.

**62.24N Analysis and Coaching of Wrestling**

(Prereq. 62.15L or equiv.) 2 Q.H.\*

Analysis of performance and techniques of teaching selected wrestling skills are covered in detail. Application of research to methodology is stressed.

**62.24P Analysis and Coaching of Baseball**

(Prereq. 62.18E) 2 Q.H.\*

The basic techniques and responsibilities of coaching interscholastic and intercollegiate baseball; to include advanced skill analysis, position and team play, conditioning, practice, organization, and team management.

**62.24Q Analysis and Coaching of Basketball**

(Prereq. 62.17C) 2 Q.H.\*

The basic techniques and responsibilities of coaching interscholastic and intercollegiate basketball; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.

**62.24R Analysis and Coaching of Field Hockey**

(Prereq. 62.17K) 2 Q.H.\*

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate field hockey; to include advanced skill analysis, position, and team play, conditioning, practice, organization, and team management.

**62.24S Analysis and Coaching of Football**

(Prereq. 62.17Q) 2 Q.H.\*

The basic techniques and responsibilities of coaching interscholastic and intercollegiate football; to include advanced skill analysis, team conditioning, offensive and defensive systems, practice organization, team management, and coaching staff organization.

**62.24T Analysis and Coaching of Handball**

(Prereq. 62.16Q) 2 Q.H.\*

Primarily for students in secondary concentration. Advanced skill analysis and coaching; current practices.

**62.24V Analysis and Coaching of Lacrosse**

(Prereq. 62.18A or 62.18K) 2 Q.H.\*

The basic techniques and responsibilities of coaching intramural, interscholastic, and



intercollegiate lacrosse; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.

**62.24W Analysis and Coaching of Soccer** (Prereq. 62.18N or 62.18R) 2 Q.H.\*

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate soccer; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.

**62.24X Analysis and Coaching of Softball** (Prereq. 62.18D) 2 Q.H.\*

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate softball; to include advanced skill analysis, and management.

**62.24Y Analysis and Coaching of Volleyball** (Prereq. 62.17J) 2 Q.H.\*

The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate volleyball to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.

**62.249 Physical Science Foundations** 3 Q.H.\*

A treatment of basic concepts and fundamentals of chemistry and physics as applied to human physiology and movement.

**62.250 Anatomy and Physiology I** 4 Q.H.\*

Gross anatomy and physiology of the human skeletal, joint, and muscular systems.

**62.251 Anatomy and Physiology II** (Prereq. 62.250 or consent of instructor) 4 Q.H.\*

Gross anatomy and physiology of the human nervous and circulatory systems.

**62.252 Anatomy and Physiology III** (Prereq. 62.251 or consent of instructor) 4 Q.H.\*

Gross anatomy and physiology of the human respiratory, digestive, urinary and endocrine systems; intermediary metabolism and calorimetry.

**62.253 Kinesiology** (Prereq. 62.250 or equiv.) 4 Q.H.\*

Science of human motion and anatomic and mechanical principles as they relate to an understanding of skillful, efficient, and purposeful human motion. Introduction to cinematographic analysis.

**62.254 Exercise Physiology** (Prereq. 62.252) 4 Q.H.\*

Study of the immediate and long-range effects of exercise upon the human body, with emphasis on the cardiovascular and respiratory systems, muscles and metabolism; physical fitness, body composition, and selected components of motor performance—Assessment techniques and training principles. Introduction to indirect, open-circuit calorimetry and EKG monitoring.

**62.255 Adapted Physical Education** (Prereq. 62.252 or equiv.) 4 Q.H.\*

Study of disabilities which prevent participation in unrestricted physical education programs. Selection and modification of physical activities to meet individual needs.

**62.256 Athletic Training and Conditioning** 3 Q.H.\*

The training and conditioning procedures in athletic programs; special emphasis on the prevention of athletic injuries; role of the trainer, athlete, coach, and health service.

**62.257 Advanced Athletic Training** (Prereq. 62.256) 4 Q.H.\*

The advanced preparation and utilization of programs of conditioning and administration for prevention and care of injuries associated with competitive athletics.

**62.258 Advanced Kinesiology** (Prereq. 62.253) 4 Q.H.

A continuation of the study of anatomic and mechanical considerations as they apply to the analysis of motor skill performance. Emphasis upon the application of anatomic and mechanical principles to the analysis of selected sports techniques. An introduction to biomechanical instrumentation.

**62.260 Measurement and Evaluation** 4 Q.H.

Construction, use, selection, and interpretation of evaluative tools applicable to physical education; elementary statistical methods.

**62.270 Administration of Physical Education**

(Prereq. 62.210) 4 Q.H.

The organization and administration of programs in physical education, with emphasis on the elementary and secondary school program.

**62.273 Sports Officiating**

2 Q.H.\*

Theory, practice, and techniques of officiating. Choice of: basketball, volleyball, softball, soccer, field hockey, lacrosse.

**62.274 Sports Officiating**

2 Q.H.

Theory, practice, and techniques of officiating. Choice of: basketball, volleyball, softball, soccer, field hockey, lacrosse.

**62.275 Critical Teaching Skills**

3 Q.H.

Experience using the taxonomies of educational objectives to write, conduct, and evaluate educational and behavioral objectives. Analysis of direct and indirect, verbal and nonverbal teaching behavior for classroom and activity teaching to be studied by micro-teaching, simulation, and interaction analysis techniques.

**62.277 Outdoor Teaching Lab**

2 Q.H.

A three-week resident summer practicum at the Warren Center. Provides opportunities for assumption of counseling, teaching, and leadership roles in special camp programs, and sports, nature, pioneering, arts and crafts, and aquatics. Youngsters of various ages from the Boston area are assigned in residence as subject campers.

**62.279 College Teaching Experience (Pass/Fail)**

(Prereq. Seniors with consent of instructor) 1 Q.H.\*

Experience in teaching physical education at the college level. Achieved by assisting and teaching in University classes supervised by a member of the college faculty.

**62.280 Curriculum Development**

(Prereq. 62.275 or consent of instructor) 3 Q.H.

Basic foundations of curriculum development stressing fundamental principles and guides to curriculum organization, format, and evaluation. Survey of existing curricula and the development of an understanding of current curriculum trends.

**62.282 Supervised Student Teaching**

12 Q.H.

Assignment to public school(s) for observation and practice teaching under the guidance of a cooperating teacher and a college supervisor. Association with the main duties assumed by physical education teachers, including coaching and/or intramural organization and supervision. Individual conferences and seminars.

**62.283 Modern Dance Composition**

(Prereq. 62.12F or consent of instructor) 3 Q.H.\*

An analysis of dance composition, with practice in choreography for solo, duet, and trio.

**62.284 Dance History and Philosophy**

4 Q.H.

A survey of dance from ancient times to the present. Consideration of dance as an art form in relation to other art forms and of dance as an educational discipline.

**62.286 Dance: Choreography and Production**

4 Q.H.\*

Choreography for trio, quartet, and large groups based upon the projection of an idea or mood. Theory and practice in the staging of student choreography, including lighting, costuming, scenery, and makeup.

**62.287 Jazz Dance Composition**

(Prereq. 62.12M) 3 Q.H.

Theory and practice in the use of eurhythmics as applied to jazz movement. Progression to dance composition for jazz theatre and musical comedy.

**62.288 Recreational Dance**

(Prereq. 62.12B or equiv.) 2 Q.H.\*

Theory and practice of the methods and materials in the teaching of recreational dance forms at the primary and secondary levels.

**62.289 Creative Dance I**

(Prereq. 62.12F or equiv.) 2 Q.H.\*

Theory and practice of methods and materials in the teaching of creative dance to elementary school children. Examination of the aims and responsibilities of dance education at the primary level.

**62.290 Creative Dance II**

(Prereq. 62.12F or equiv.) 2 Q.H.\*

Theory and practice of methods and materials in the teaching of creative dance to secondary school children. Examination of the aims and responsibilities of dance education at the secondary level.

**62.291, 62.292, 62.293 Special Problems**

(Prereq. Consent of Dept. Chairman) 2, 3, or 4 Q.H.

Independent investigation of physical education in an area of each student's interests. The investigation will be supervised by an appointed faculty member and will culminate in a formal written report.

## Recreation Education

**63.112 Seminar on Contemporary Issues**

4 Q.H.

Same as 63.812.

**63.120 Orientation to Recreation**

1 Q.H.

A general orientation to the entire field of recreation and its role in society. Exposure to background, goals, philosophy, leadership, and programs in various settings. Orientation to the curriculum, the three-track system, and career opportunities.

**63.12A Social Recreation I**

1 Q.H.

Aimed at developing skill in selecting appropriate social recreational activities and employing effective methods of organizing and teaching these activities to groups. Content areas to be explored include active and passive games, mixers, paper and pencil and table games.

**63.12B Social Recreation II**

1 Q.H.

Aimed at developing skill in organizing various social recreational activities into meaningful and effective social recreation programs. Population to be considered: children, youth, young adults, senior citizens, and residents in nursing homes.

**63.12C Basic Folk Dance**

1 Q.H.

Basic national and international folk dances appropriate for use with a wide range of age groups. Development of appreciations and understandings of the values and program potential of folk dance to receive primary consideration. General techniques of teaching to be included.

**63.12D Dramatic Games**

1 Q.H.

Dramatic games and activities suitable for use in recreational programs at camps, playgrounds, hospitals, nursing homes; community and agency settings. Basic nature of this course will be participation and creative demonstrations of these activities.

**63.12E Paper Crafts**

1 Q.H.

The use of paper to create "illusions." The primary study area will include origami, paper design, veiling and foiling; sketching with pencil, charcoal and pastels. The study of perspective; and the use of water colors and acrylics in painting.

**63.12F Sculpture**

1 Q.H.

An introduction to various simple forms of sculpture including papier maché, soap, stone, wire, clay and wood.

**63.12G Textiles**

1 Q.H.

An introduction to textile printing, weaving and macramé. Study areas will include block printing, silk screen printing, tie dyeing, batik, string designs, macramé and simple handloom weaving.

**63.12H Inexpensive Crafts**

1 Q.H.

Employs the use of collected scrap materials in arts and crafts programs.

**63.12I Guitar I**

1 Q.H.

An introduction to the use of guitar in recreation programs. Skill development will include basic chords, progressions, and strumming techniques.

\*Including lab.

**63.12J Guitar II**

(Prereq. 63.12I) 1 Q.H.

Concentration will include basic picking techniques, the use of bass notes to enhance music, additional progressions and chords.

**63.12K Square Dance**

1 Q.H.

The development of the following skills: performance, teaching and calling. The course content will cover beginner through advanced square and contra dances. Understandings related to historical development and values to be included.

**63.12L International Folk Dance I**

1 Q.H.

Folk dances of Northern Europe, Scandinavia, and Mediterranean countries. The course emphases are on developing performance skills, teaching skills and appreciation.

**63.12M International Folk Dance II**

1 Q.H.

Folk dances of the British Isles, Central Europe, and South American countries. The course emphases are on developing performance skills, teaching skills and appreciations.

**63.12N International Folk Dance III**

(Prereq. 63.12M) 1 Q.H.

Folk dances of Slavic, Baltic and Southern European countries. The course emphases are on developing performance skills, teaching skills and appreciations.

**63.12P Sports Leadership**

2 Q.H.

The exploration of teaching techniques involving team, dual and individual sports. Methods, such as the part-whole, or whole-part will be presented and investigated to establish relevance to each of the sport areas under study. Students will develop skill in planning units and individual lessons. In addition students will apply theory and practical experience by teaching one lesson in each of the sports areas studied.

**63.12Q Survey of Aquatics**

(Prereq. Demonstrated swimming proficiency) 2 Q.H.

Exploration of various aquatic events that can enhance recreational swimming programs. Students will develop planning, execution and evaluation techniques for each area of study. In addition, students will attend and evaluate a planned water event. Areas of study will include party events for all ages, competitive swimming and diving, synchronized swimming, water polo, events for the atypical.

**63.12R Rhythm Bands**

1 Q.H.

The rhythmic aspect of music is perhaps the most stimulating and, without question, the simplest part of all the ingredients in music to understand. Percussive instruments such as cymbals, drums of many sizes, xylophones, triangles and other rhythmic instruments help create many interesting patterns of sound and are studied in their relationship to rhythm.

**63.12S Handcrafted Games**

1 Q.H.

A practical laboratory experience in constructing recreational games with a variety of inexpensive media and re-cycled materials: paper, cardboard, styro-foam, boxes, plastics, wood, nuts, bolts, etc. The techniques of mitering, soldering and drilling will be emphasized in the construction of the games. Adaptations and special devices to accommodate persons with a wide variety of disabilities will be considered in the course content.

**63.12T Photography**

1 Q.H.

The history of photography, types of cameras, use of black and white and color films, use of F-stops and shutter speeds, dark room equipment, supplies and procedures. Field trips utilizing photography techniques and dark room experience will complete the course.

**63.12U Cultures**

1 Q.H.

The study of cultures throughout the world. Students will investigate various countries in terms of history, climate, topography, occupations, customs, music, instruments, festivals and holidays; folklore and folk art.

**63.12V Introduction to Organized Camping**

1 Q.H.

Course basis will lead up to the practical experience (63.124) at the Warren Center. Includes history of camping, types of camps, camp seasons and sessions, variety in programs and emphases, common features, objectives, contributions, and limitations of camping, American Camping Association, current trends, and study of children in groups.

**63.12W Organizing and Leading Wilderness Trips**

1 Q.H.

Emphasis will be on planning techniques and qualifications of trip-leading personnel. Included will be: campcraft skills, menu planning, financing, purchasing supplies, scheduling, health and safety procedures, types and usage of equipment for backpacking, wilderness camping, camping and itinerary planning. A backpacking trip will be included in the course. Lab fee.

**63.12X Wilderness Camping**

1 Q.H.

A seven-day primitive wilderness experience. Students will spend two days in residence at Warren Center reviewing skills, preparing equipment, and packing supplies and five days in wilderness. The camping program will include: canoeing, mountain climbing, nature study, overnight trips and other field trips. Lab fee.

**63.12Y Introduction to Winter Skills**

1 Q.H.

Course will investigate several winter sports, their origins and history, current population demands and future trends. Students will be exposed to various types and usage of equipment as well as special health and safety considerations for winter sports. Sports to be studied will include: cross country skiing, snow shoeing, skating, tobogganing and snowmobiling.

**63.12Z White Water Canoeing**

(Prereq. Life-saving and basic Canoeing Certificate) 2 Q.H.

Course will include: history of white water canoeing, differences in canoes, river ratings, and how to read white water. Safety considerations and review of skills course will culminate in a one-week trip experience. Lab fee.

**63.120 Professional Orientation to Recreation**

1 Q.H.

Philosophy and scope of modern recreation and its role in society. Observation—field trips to diverse recreational settings. Brief survey of current trends and issues.

**63.124 Camp Leadership**

2 Q.H.

One-week resident camp experience at the Warren Center. Course includes: natural sciences, Red Cross basic sailing and canoeing, camp-craft skills, outdoor sports and leadership techniques for special camp programs. Fee charged for room and board.

**63.126 Outdoor Education I**

3 Q.H.\*

Interpretation of natural science and ecology. Emphasis on the development of personal skills through laboratory, field trips, lectures, and learning experiences in the out-of-doors.

**63.127 Outdoor Education II**

3 Q.H.\*

Emphasis in developing understanding, interest, and field biology skills for ecology, conservation, and recreation.

**63.128 Survey of Outdoor Recreation and Park Facilities**

3 Q.H.

Fundamental management and administration concepts for a wide variety of outdoor areas and facilities such as parks, beaches, ice rinks, marinas, and camps.

**63.129 School Camping**

3 Q.H.

Administration and leadership in school outdoor education and conservation programs in the natural environment. Field trips and laboratory include experience with school-age groups.

**63.130 Advanced Administration of Recreation Services**

4 Q.H.

Same as 63.830.

**63.140 Sailing**

(Prereq. 63.124 and basic sailing) 2 Q.H.

One week of intensive instruction leading to Red Cross Instructors and Standard First Aid Certification (students must successfully pass written and practical exam to be certified). Participants will be in residence at the Warren Center for the duration of the course. Fee charged for room, board, and books.

**63.141 Canoeing**

(Prereq. 63.124 and basic canoeing) 2 Q.H.

One week of intensive instruction leading to Red Cross Instructors and Standard First Aid Certification (students must successfully pass written and practical exams to be certified). Canoe trips may be included in this program. Participants will be in residence at the Warren

\*Including lab.

Center. Fee charged for room, board, and books.

**63.142 Water Safety Instructor** (Prereq. 63.124 and life saving) 2 Q.H.  
One week of intensive skill development and teaching techniques leading to Red Cross Instructors and Standard First Aid Certification (students must successfully pass written and practical exams to be certified). Pool and lake training will be utilized. Participants will be in residence at the Warren Center. Fee charged for room, board, and books.

**63.143 Winter Sports** 2 Q.H.  
Five-day resident session. Instruction and practice in Alpine and Nordic skiing (downhill and touring), snow-shoeing, winter mountain hiking, winter camping skills; optional overnight campout as well as environmental observations in the winter season. Fee charged for room and board. Equipment rented as needed.

**63.144 Tripping and Orienteering** (Prereq. 63.124) 2 Q.H.  
One week intensive practical experience in the art of orienteering and its uses in trip camping, backpacking and overnight camping. Red Cross Standard First Aid and ACA Campcraft Certification will be included as part of this course (students must successfully pass written and practical exams to be certified). Participants will be in residence at Warren Center. Fee charged for room, board, and books.

**63.145 Winter Sports** 2 Q.H.  
Five-day resident session. Instruction in alpine skiing, ski-touring, and snow-shoeing. Environmental observations and lectures. Fee charged for room and board. Equipment rental as needed.

**63.146 Camp Administration** 3 Q.H.  
Major problems involved in the establishment and operation of organized camps, including school, summer, and day camps. Selection of camp sites: sanitation, program, schedule, training personnel, finances, good management, and promotion.

**63.147 Outdoor Education for the Handicapped** 3 Q.H.  
Program planning, methods of conducting programs relating to adaptation of facilities and activities necessary for the physically and mentally disabled, including observations, participation and direct laboratory experience.

**63.148 Introduction to Outdoor Recreation Education** 3 Q.H.  
An introduction to all aspects of mountaineering, exposing students to the physical, emotional, and intellectual challenges afforded by technical mountaineering. An interdisciplinary study drawing upon social, physical and natural sciences such as physical, political and economic geography; glaciology, meteorology; structural geology, physiology and social psychology, etc. Basic skills will be developed in friction and technical climbing, route finding, navigation, expedition planning and wilderness living. The course includes a technical rock climbing laboratory and a two-day mini-expedition in the Northern Presidential Range.

**63.149 Elements of Outdoor Planning** 3 Q.H.  
This course is designed to investigate two areas: 1) the phenomena of outdoor recreation including its nature, significance, scope and trends; and 2) planning concepts (design), policy formation, administration, management and maintenance. The course will focus on camps, park areas (including state and federal lands), and other outdoor areas and facilities.

**63.150 Anatomy and Physiology I** 3 Q.H.  
Gross anatomy and physiology of the human skeletal, articular, muscular, and nervous systems. Implications for recreation programs.

**63.151 Anatomy and Physiology II** 3 Q.H.  
Gross anatomy and physiology of the human endocrine, circulatory, respiratory, digestive, and urinary systems. Implications for recreation programs.

**63.152 Analysis of Movement as Applied to Recreation** 4 Q.H.  
The identification of muscles and muscle groups that may be involved in therapeutic recreation activities, which will enable the student to select the most suitable activity for a

given disability. Includes analysis of movement and a review of muscle attachment and action.

**63.153 Social and Psychological Impacts of Disabilities** 4 Q.H.

An interdisciplinary approach to social and psychological understanding of the impact of disabilities and handicaps, enabling the recreation therapist to evaluate and understand behavioral changes in the handicapped population.

**63.160 Technological Resources** 3 Q.H.

A study of practical use by recreation professionals of audiovisual, instructional, and computer technology.

**63.210 Philosophy of Recreation** 3 Q.H.

A study of history, theories, concepts, attitudes of play, recreation, and leisure related to developing a personal philosophy. Viewpoints and input from other fields as they apply to recreation and leisure.

**63.216 Seminar on Issues and Legislation in Outdoor Recreation/Education** 3 Q.H.

This course will investigate non-fiction writing, public relations methods, and media agencies that have had an impact on recent issues in outdoor recreation/education. The course relates each of these areas to federal and state legislation implemented within the past 10 years. Course will include discussion and exposure to procedures for proposing legislation, lobbying and political pressure techniques.

**63.220 Methods and Materials in Recreation** 3 Q.H.

Program planning in recreation includes the study of the physical, social, and emotional characteristics and needs of all age groups, and the most appropriate recreational programs that meet the needs of these individuals and groups. Also includes programs for special occasions and evaluation of programs for improvement purposes. The role of leadership in developing and operating programs is discussed.

**63.230 Community, School and Interagency Programming** (Prereq. 63.132) 3 Q.H.

Principles and process of program construction. Inter-agency communications—planning—function. Survey of community agencies and institutions. Volunteer and professional leadership. Legislation and governmental programs.

**63.249 Process of Aging** 3 Q.H.

The study of phases of aging. Discussing the physical, social and emotional changes or problems which face the aged. The study of types of services offered to senior citizens; sources of funds allocated to sponsor such services. The role of recreation will be emphasized.

**63.250 Group Dynamics** 3 Q.H.

Designed for promoting an understanding of group processes and developing human relations skills. Major areas of concentration include: communications, leadership, decision-making, and evaluation of the group process.

**63.254 Introduction to Therapeutic Recreation** 3 Q.H.

Understanding of the needs and attitudes of and toward people who are impaired, disabled, or handicapped. Study of the various disabling diseases and conditions, as well as the people in therapeutic recreation services.

**63.255 Introduction to Therapeutic Recreation** 3 Q.H.

Philosophy and concepts of the scope of recreation therapy in the process of rehabilitating disabled and handicapped people. An orientation to disabilities and their impact on the individual, family and society. Includes medical terminology and field visitations.

**63.256 Recreation Activities for Special Populations** 3 Q.H.

Basic principles of programming for special populations. Adaptation of recreation activities to meet the needs of handicapped individuals in a variety of settings.

**63.257 Workshop in Therapeutic Recreation** 3 Q.H.

A practical application in designing and implementing a series of innovative recreation programs for special populations.

**63.260 Administration of Recreation and Parks**

4 Q.H.

Administration procedures of tax-supported recreation and park operations. Concentration on legality, commissions, area and facility design. Also personnel policies and problem solving related to administration and management.

**63.262 Budgeting Systems in Recreation**

3 Q.H.

A study of planning-programming-budgeting systems (PPBS); applications in recreation. Clearly stated agency objectives and multi-year planning will be linked to systematic budget decisions. The course will be applicable to all areas of recreation. Topics of special interest to the class (e.g., bidding procedures) will also be discussed.

**63.263 Introduction to Community Recreation**

3 Q.H.

An overview of community recreation that focuses on such varied types of programs as agency, YMCA, municipal, private athletic clubs, and various other organizations. Other subject areas to be included are: career opportunities, position levels, and contemporary trends in the field of community recreation.

**63.266 Recreation and Community Schools**

3 Q.H.

The place of the school in community recreation. Special emphasis on the schools' 12-month program to meet the needs of all ages. Field programs dealing with the community school concept.

**63.280 Supervised Field Experience and Teaching**

16 Q.H.

Comparable to student teaching education. Professional assignment in recreation setting; i.e., industry, center, school, hospital, agency, organization, housing, settlement, park playground, camp. Supervision and conferences; seminar.

**63.285 Introduction to Research**

4 Q.H.

A study of empirical research procedures, including: planning the study, sampling, designing instrumentation, gathering and analyzing data. Students write a research proposal, simulate response data, and analyze such data through use of computer-based statistical packages.

**63.290 Research Seminar**

(Prereq. 63.285) 4 Q.H.

Students design and carry out individual or collaborative research projects under close faculty supervision. Each student is encouraged to use the proposal developed in 63.285 (Introduction to Research) as a basis for such a project. A written report of research findings is required.

**63.291, 63.292, 63.293 Independent Study**

Under the guidance and direction of his/her program adviser, the student develops and conducts a small project related to his/her professional interest. Credit of one, two, or three quarter-hours.

**63.295 Recreation—Administration and Services**

4 Q.H.

Study of basic principles, functions and techniques of organization and administration. Role and responsibilities of the leader and director. Focus on the diversity of recreation programs, services and facilities in current operation. Practical experience in local settings.

## Physical Therapy

**64.114 Introduction to Physical Therapy**

2 Q.H.\*

Orientation to the field of physical therapy and its role in the health professions; theory and practice in applied body mechanics and basic procedures related to patient management.

**64.115 Introduction to Physical Therapy**

(Prereq. 64.114) 2 Q.H.\*

Practice in the preparation of patients and equipment for various treatment procedures. Introduction to ambulation and safety procedures. Theory demonstration and practice in heat, light hydrotherapy.

**64.123 Gross Anatomy**

(Prereq. 18.126, 18.148, 64.115) 6 Q.H.\*

The structure and functions of the human body with particular emphasis on the skeletal,



muscular and nervous systems. Lecture and laboratory with dissection.

**64.125 Physiology for Physical Therapists** 3 Q.H.

Neuromuscular, cardiovascular and respiratory physiology, and physiology of heat and cold related to physical therapy.

**64.130 Applied Anatomy** (Prereq. 64.123, 64.141) 4 Q.H.\*

A further study of neuromuscular function with emphasis on the mechanical and physiological factors involved; application to normal and pathological movements.

**64.141 Physical Therapy I** (Prereq. 11.172, 18.126, 18.148, 64.115) 2 Q.H.\*

Theory, demonstration and practice in massage.

**64.142 Physical Therapy II** (Prereq. 64.123, 64.141, 62.221) 3 Q.H.\*

Theory, demonstration and practice in evaluation procedures.

**64.143 Physical Therapy III** (Prereq. 64.123, 64.141, 62.221) 4 Q.H.\*

Theory, demonstration and practice in basic therapeutic exercise.

**64.156 Physical Therapy IV** (Prereq. 64.130, 64.142, 64.143) 3 Q.H.\*

Theory, demonstration and practice in prosthetics and orthotics; analysis of functional activities.

**64.158 Physical Therapy V** (Prereq. 64.130, 64.142, 64.143) 4 Q.H.\*

Theory, demonstration and practice in advanced therapeutic exercise.

**64.159 Clinical Seminar** (Prereq. 64.158, 64.171, 64.250) 3 Q.H.

Selected topics related to clinical aspects in physical therapy. Interpersonal relationships, ethics and teaching methods.

**64.167 Research Design and Methodology** 4 Q.H.\*

Introduction to scientific methodology and preparation of an independent research proposal; electromyography.

**64.169 Physical Therapy VII** 2 Q.H.\*

Theory, demonstration and practice in electrical testing and treatment procedures.

**64.171 Physical Therapy VI** (Prereq. 64.130, 64.142, 64.143) 2 Q.H.\*

Physical therapy management of medical and surgical chest disorders.

**64.173 Rehabilitation** (Prereq. 64.159, 64.178) 2 Q.H.

Concepts of rehabilitation and community health presented by Allied Health personnel. Emphasis on the role of the physical therapist as a member of the health team. Class discussion and seminar.

**64.176 Administration** (Prereq. 64.173) 3 Q.H.

Principles and methods in administrative responsibilities, including supervision and consultation.

**64.178 Physical Therapy VIII** (Prereq. 64.156, 64.158, 64.171) 2 Q.H.\*

Analysis of evaluation procedures for specific cases and planning therapeutic exercise programs, integrating all methods of treatment.

**64.182 Psychosocial Aspects of Illness** (Prereq. 64.173) 2 Q.H.

Interpersonal relationships between patient, family, therapists and society with reference to the impact and reactions to illness.

**64.184 Supervised Clinical Education I**

(Prereq. satisfactory attainment in all prior professional courses) 5 Q.H.

An introduction to clinical experience providing the student with opportunities to practice various skills in the evaluation and treatment of patients under supervision. Emphasis is placed on an understanding of treatment planning. Five weeks during Quarter 9 of the Junior year in the Boston Area.

**64.194 Supervised Clinical Education II** 12 Q.H.

Advanced clinical experience (full time) providing the student will further opportunities to practice various phases of physical therapy under supervision in preparation for assuming

the role of a qualified physical therapist. Assignments in Massachusetts and other states. *Required for graduation from the physical therapy program.*

**64.210 Pathology** (Prereq. 11.172, 18.126, 18.148, 64.115) 3 Q.H.  
Lectures and demonstrations of pathological and gross specimens. Inflammation, repair, infection, immunity and hypersensitivity, degenerative processes, disturbances of metabolism and circulation; disorders of growth, including tumors.

**64.227 Clinical Medicine I** 2 Q.H.  
Pediatric and laboratory medicine.

**64.229 Clinical Medicine II** 3 Q.H.  
Orthopedics and orthopedic surgical conditions.

**64.230 Clinical Medicine III** 3 Q.H.  
Lectures covering various areas of medicine and neurology related to conditions commonly encountered in patients treated by physical therapists.

**64.234 Clinical Psychiatry** (Prereq. 18.126, 18.148, 19.102, 19.140) 2 Q.H.  
Review of psychiatric categories including consideration of etiology and treatment. Psychosocial variables significant in the management of patients with whom the physical therapist is concerned.

**64.239 Investigative Studies** 6 Q.H.  
Selected activities related to current issues and trends in the profession of physical therapy, clinical specialties and research.

**64.250 Neuroanatomy** (Prereq. 64.130, 64.142, 64.143) 3 Q.H.\*  
Morphological and functional management of the nervous system; derangement of normal structure and function of the nervous system in various diseases. Lecture and laboratory with dissection.

## School and Community Health Education

**65.110 Foundations of Health Education** 2 Q.H.  
Orientation to school health education: introduction to the conceptual approach in the field, with emphasis on personal health and the factors which influence it. Introduction to the philosophy of health education.

**65.114 Mental Health** (Prereq. 19.102 or equiv.) 4 Q.H.  
An investigation of mental illness and well-being as they relate to total health, with concern for the factors that influence mental and emotional behavior. Various approaches to mental health education in school programs included.

**65.116 Nutrition** (Prereq. 12.102) 4 Q.H.  
The principles of good selection, including knowledge of the basic nutrients, with emphasis on building and maintaining sound health. Nutritional problems such as deficiency diseases, food fallacies and fads, and weight control, including various approaches to nutrition education in school programs.

**65.117 Public Health** 4 Q.H.  
History and overview of public health agencies and the organization of services for meeting community health needs at the local, state, federal and international levels. Focus on today's major health problems.

**65.118 Drug Use and Abuse** 4 Q.H.  
The use and abuse of modern drugs in our society, including prescription and nonprescription drugs, alcohol and tobacco, and their physiological and psychological effects on the body; the social problems surrounding drug abuse, including various approaches to drug education in school programs. (Open to all N.U. students.)

**65.129 Health Education** 3 Q.H.  
Principles of personal health; emphasis on information pertinent to mental and physical well-

\*Including lab.

being, current social behavior, and effective approaches to college living.

**65.130 Health Problems of the College Student**

(Prereq. Physical Education majors only) 3 Q.H.

Discussion of the major health problems affecting college students. Principles of personal health, with emphasis on healthful college living.

**65.140 Concepts in Health, Aging, and Longevity**

4 Q.H.

Principles of the aging process and implications for diverse community, state, and national health programs.

**65.149 Personal Health**

4 Q.H.

Principles of healthful living; their application to interpersonal relations and physical education.

**65.160 Instructional Resources**

2 Q.H.

Survey of audio-visual media. Actual operation of selected types of equipment. Production of transparencies, felt boards, etc. Creative approaches stressed.

**65.191 Independent Study I**

4 Q.H.

**65.192 Independent Study II**

4 Q.H.

**65.193 Independent Study III**

4 Q.H.

**65.207 First Aid, Safety, and Preventive Health Education**

(Prereq. 65.110) 4 Q.H.

Focus on standard first aid, personal safety practices, and consumer health issues with emphasis on the development of prevention-conscious habits and attitudes.

**65.208 First Aid**

2 Q.H.

Provides students with first aid-knowledge and skill competencies necessary to care for selected injuries and to meet certain emergencies. Successful completion of the course leads to certification in first aid by the American National Red Cross.

**65.209 Introduction to Safety**

(Prereq. 65.110) 2 Q.H.

Introduces the principles and fundamentals of safety education as they relate to people in their environment. Concerns safety as a social problem and considers major accident areas, accident causes, liability and analyzes possible solutions to accident problems.

**65.217 Teaching Procedures/Curriculum in Health Education in School and Community**

(Prereq. 19.146 or equiv.) 4 Q.H.

Current methods, with study of new approaches to instruction in health education. Includes analysis of curriculum and the relationships among curricula and teaching methods.

**65.218 Public Health**

3 Q.H.

Principles of public health, with particular emphasis on the emerging patterns of community organization and activities in the public health field.

**65.222 Drug Use and Abuse**

(Prereq. 65.114, majors only) 4 Q.H.

Investigation of the use and abuse of modern drugs in our society, covering prescription and nonprescription drugs, alcohol and tobacco, and their physiological and psychological effects on the body. The social problems surrounding drug abuse are discussed, as are various approaches to drug education in school programs.

**65.223 Human Sexuality and the Family**

(Prereq. 50.131) 4 Q.H.

Physical, psychological, social, historical, semantic, and comparative cultural aspects of human sexuality; needs and problems at several stages of maturation, including various approaches to sex education in the school.

**65.225 Communicable and Degenerative Diseases**

(Prerq. 18.120) 4 Q.H.

The disease immunity process, with emphasis on prevalent communicable diseases in the United States today and their transmission; chronic diseases; cardiovascular diseases; cancer, diabetes, and other constitutional and degenerative diseases and disorders which affect the nation's health.

**65.233 Organization and Administration of School and Community Health Education**

4 Q.H.

Principles and methods of organization and administration of school health and community health education programs: ethics, personnel, budget, facility management, priorities.

**65.234 Health Problems of the School Child**

4 Q.H.

Recognition of common physical, mental, and emotional health problems of children and youth, so that they may be dealt with intelligently by the classroom teacher.

**65.235 Health Counseling**

4 Q.H.

The identification of physical, mental, emotional, and social health problems; remedial procedures; and counseling techniques, so that problems may be dealt with intelligently by health educators.

**65.238, 65.239 Seminar**

(Prereq. for 65.238 is 50.141) 2 Q.H.

(Prereq. for 65.239 is 65.238) 2 Q.H.

Discussion of current problems and new developments as they relate to health education in school and variety of community settings. An introduction to research culminating in the writing of a research paper.

**65.240 Student Teaching/Field Experience**

(Prereq. 65.217) 12 Q.H.

Observation and practical teaching experience in school health programs and/or field experience in selected community health education settings. Supervision and evaluation by personnel in cooperating schools and agencies and by Boston-Bouvé College faculty; seminars.

**65.241 Field Experience**

(Prereq. 65.217) 12 Q.H.

Observation and practical field experience in selected community health education settings. Supervision and evaluation by personnel in agencies and by Boston-Bouvé College faculty; seminars.

## **Pharmacy**

**71.193 Special Research Project (Pharmacy Administration)**

(Prereq. Permission of instructor with dean's approval) 4 Q.H.

A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.

**71.194 Special Research Project (Pharmacy Administration)**

(Prereq. Permission of instructor with dean's approval) 4 Q.H.

A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.

**71.195 Special Research Project (Pharmacy Administration)**

(Prereq. Permission of instructor with dean's approval) 4 Q.H.

A course of directed study or research in one of the pharmaceutical sciences wherein the student may undertake "in-depth" investigation of an area of specialized interest.

**71.201 Pharmacy Orientation**

1 Q.H.

A survey course designed to introduce the beginning Pharmacy student to the simple fundamentals of using the basic tools and equipment in the practice of pharmacy. Modern audiovisual aids explain the prescription balance, graduals, mortars and pestles, filtration, emulsification, tablet triturates, ointments and creams, suppositories, and prescription packaging.

**71.202 Pharmacy Orientation**

1 Q.H.

Calculations to enable a student to prepare various pharmaceutical formulations and prescriptions. A programmed instruction text is used.

**71.222 Pharmacy Technology**

(Prereq. 71.263) 4 Q.H.

The industrial pharmacy development of new oral liquid pharmaceutical preparations, emulsions, ointments and aerosols.

- 71.225 MEDS I** (Prereq. Anatomy and Physiology) 4 Q.H.  
First in a series of courses designed to train students in the techniques of monitoring, educating, detecting, and screening (MEDS), specific major community health care problems related to chronic disease. Organizing community support and initiating programs. Field practice will follow use of an actual community model.
- 71.243 Pharmaceutical Jurisprudence** 4 Q.H.  
A comprehensive analysis and interpretation of all laws relating to the practice of pharmacy. Federal and state food and drug laws, narcotics laws, Medicare and Medicaid regulations, and state pharmacy laws are discussed.
- 71.245 Pharmacy Administration I** 4 Q.H.  
Socioeconomic aspects of pharmacy: the government's relationship to the pharmaceutical industry, trends in contemporary practice, third-party payment plans, macroeconomic impact on the industry, and the interaction of current concepts in pharmacy.
- 71.253 Clinical Pharmacy** 7 Q.H.  
Learning to observe patient response to medication and to evaluate and advise on all factors which may modify efficacy, safety, and economy of therapy. Lectures are devoted to basic facts needed to make evaluations and reports. Laboratory consists of two mornings of medical work rounds in the hospital, as well as case discussion orientation in various medical specialties.
- 71.260 Basic Pharmacy** 5 Q.H.\*  
Introduction to pharmacy, its scope and fundamental principles. Practice in the use of prescription balance, mortar and pestles and other basic equipment used in pharmacy practice. Initial study of physicochemical principles involved in preparing medicinal preparations and the associated calculations used in their development.
- 71.261 Pharmacy I** (Prereq. 12.145) 4 Q.H.  
A study of the application of basic physicochemical principles as they relate to drug dosage, form design, preparation, stabilization and evaluation. Major topics of consideration will include solution, interfacial phenomena, colloidal dispersions, suspensions, emulsions, complexation and protein binding.
- 71.262 Pharmacy II** (Prereq. A passing grade in 71.261) 4 Q.H.\*  
The application of physical pharmacy to the study and preparation of solid dosage forms (i.e., powders, capsules, tablets and suppositories) and suspensions. Three 50-minute lectures, one three-hour laboratory period and one one-hour laboratory lecture ("Alternate") on alternate weeks.
- 71.263 Pharmacy III** (Prereq. 71.262) 4 Q.H.\*  
A continuation of 71.262, with further reference to official and nonofficial preparations and more advanced dosage forms.
- 71.264 Pharmacy IV** (Prereq. 71.263) 4 Q.H.  
Physicochemical considerations relating to drug effectiveness and dosage form design.
- 71.283 Professional Practice I** (Prereq. 71.264) 4 Q.H.  
Correlates previous pharmacy courses. Emphasis is placed on chemical incompatibilities.
- 71.284 Professional Practice I Laboratory** (Prereq. 71.264) 1 Q.H.  
The compounding and dispensing of solid and liquid medication. Emphasis is placed on the correlation of Professional Practice I lecture material. Prescription practice also involves proprietary medications.
- 71.285 Professional Practice II** (Prereq. 71.283) 3 Q.H.  
A continuation of Professional Practice I, including lecture demonstration designed to provide the student with practical knowledge of various surgical devices, appliances, and hospital and sickroom supplies used in modern patient care.
- 71.286 Professional Practice II Laboratory** (Prereq. 71.283) 1 Q.H.  
Prescription practice is continued with emphasis on specialties and possible drug interactions.

\*Including lab.

- 71.287 Professional Practice III** (Prereq. 71.285) 4 Q.H.  
The current practice of pharmacy. The practical aspects of pharmacy, including the various laws and problems of non-prescription pharmaceuticals applied to case situations in dispensing.
- 71.290 Hospital Pharmacy I** 4 Q.H.  
The relationship of the pharmacy to the total hospital structure. Designing the physical plant, staffing, personnel management, and the law of institutional practice.
- 71.291 Hospital Pharmacy II** (Prereq. 71.290) 4 Q.H.  
An in-depth analysis of various concepts relating to hospital pharmacy. The course will include comprehensive treatment of topics by other health professionals at their respective institutions.
- 71.292 Seminar in Community Pharmacy Management** 4 Q.H.  
A discussion course on all phases of community pharmacy operations with extensive utilization of the case method of instruction.
- 71.293 Pharmaceutics Special Research Project**  
(Prereq. Permission of instructor(s) with dean's approval) 4 Q.H.  
A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.
- 71.294 Pharmaceutics Special Research Project**  
(Prereq. Permission of instructor(s) with dean's approval) 4 Q.H.  
A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.
- 71.295 Pharmaceutics Special Research Project**  
(Prereq. Permission of instructor(s) with dean's approval) 4 Q.H.  
A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.
- 71.298 Financial Management** 4 Q.H.  
The fundamentals of accounting and finance with emphasis on its application to retailing and community pharmacy management. Accounting systems, analysis of financial statements, budgets, cash flow, taxation, and finance shall be covered in depth.
- 71.299 Parenterals** (Prereq. 18.120 Microbiology) 4 Q.H.\*  
A basic course covering various techniques in preparing solutions for injection, methods of sterilization, filling of ampuls and multiple dose vials, familiarization with equipment, laminar flow study, clean room design, area preparation and sterility, solvent requirements, labeling, short term stability studies, sterility testing of completed injectables, incompatibility studies.
- 72.230 Drug Analysis** (Prereq. 12.145) 5 Q.H.\*  
A survey of the quantitative analytical techniques applicable to the evaluation and assay of natural and synthetic drugs and their formulations. Emphasis on chromatographic, spectroscopic, and other instrumental methods, with selected laboratory experiments in the use of these as defined in official compendia.
- 72.253 Medicines Out of the Earth** (Prereq. 12.144, 12.145, 18.131 and 18.132) 4 Q.H.  
The historical use of plants as drugs and their role in the development of modern medicinal and pharmaceutical preparations. The course will introduce a variety of modern approaches to the discovery of new drugs, with reference to current research programs employing them, and employ films, slides and demonstrations to illustrate the techniques involved.
- 72.260 Radiopharmaceuticals** 4 Q.H.  
This course will comprise the study of the physics, chemistry and pharmaceutical use of radiopharmaceuticals. Methods for preparation and handling of these drugs will be discussed in a practical way as well as the rationale for their use in diagnosis and therapy.
- 72.261 Identification of Abuse Drugs** (Prereq. 12.171, 72.230 or equiv.) 4 Q.H.  
An introduction to the chemistry, biological action and methods of detection and assay of commonly abused drugs.

**72.262 Chemical Pharmacognosy**

(Prereq. 12.145, Organic Chemistry; 72.230, Drug Analysis or permission of instructor) 4 Q.H.

An introduction to modern pharmacognosy and chemotaxonomy with emphasis on methods of plant screening for potentially useful medicinals and pharmaceutical adjuncts: laboratory exercises including the identification and isolation of such principles from known and/or previously uninvestigated plants.

**72.266 Chemical Pharmacology II**

5 Q.H.

A continuation of 72.242, with special emphasis on drugs affecting hematopoietic systems, the kidneys, and the endocrine and reproductive systems.

**72.267 Chemical Pharmacology III**

5 Q.H.

A continuation of 72.266, with special emphasis on anti-infective and other chemotherapeutic agents, biologicals, and vitamins.

**72.270 Medicinal Chemistry**

(Prereq. 18.132, General Biology and 12.145, Organic Chemistry) 5 Q.H.

An introduction to the principles of pharmacognosy, pharmacology, and medicinal chemistry applied to the discovery of drugs of therapeutic utility in man; a detailed discussion of drugs affecting the central nervous system.

**72.271 Medicinal Chemistry/Pharmacology II**

(Prereq. 72.270, Medical Chemistry/Pharmacy I) 5 Q.H.

Continuation of 72.270. An interdisciplinary approach to the fundamental chemical and pharmacological principles of drug action. A discussion of structure-activity relationship, absorption characteristics, metabolic fate, pharmacodynamics and therapeutic application of principally those drugs acting at sympathetic and neuroeffector junctional sites.

**72.272 Medicinal Chemistry/Pharmacology III**

(Prereq. 72.271) 5 Q.H.

A continuation of 72.271 with special emphasis on drugs affecting the hematopoietic systems, the kidneys, and the endocrine and reproductive systems.

**72.273 Medicinal Chemistry/Pharmacology IV**

(Prereq. 72.272) 5 Q.H.

A continuation of 72.272 with special emphasis on anti-infectives and other chemotherapeutic agents, biologicals, and vitamins.

**73.111 Drugs—Their Uses and Actions**

4 Q.H.

Attempts to present an integrated background, classification, dose responses, untoward side effects, uses and the commercial preparations of a broad series of drugs. (Not open to Pharmacy majors.)

**73.114 Basic Pharmacology**

(Prereq. 12.107, 86.140, 86.141, 86.136, 86.137, 86.138, 86.139, or consent of instructor) 3 Q.H.

Designed to present the classification, uses, and commercial preparation of a wide variety of drugs of social, therapeutic and diagnostic significance. The course contents will contain introduction to pharmacology, hematologic drugs, vitamins and nutritional agents, neurotropic drugs, analgesics, cardiotropic agents, anesthetic agents, antibiotics, and hormones.

**73.116 Pharmacodynamics** (Prereq. 18.148, 18.125, 18.120, 12.106 and 12.107) 3 Q.H.

Introductory expositions of pharmacologic principles with the pharmacotherapeutics of drug groups and individual drug substances of particular importance in treatment and diagnosis of disease.

**73.117 Pharmacology for the Respiratory Care Practitioner**

4 Q.H.

An orientation to pharmacology, including the scope of pharmacology definitions, drug standards, and drug legislation, names, sources, active constituents, and pharmaceutical preparations of drugs relating to the respiratory care practitioner.

**73.202 Anatomy-Physiology**

(Prereq. 12.145, Organic Chemistry; and 18.132, Animal Biology) 5 Q.H.

Structure and function of cells, tissues and organs, including the muscular and endocrine

systems. The laboratory includes human skeletal anatomy and cat dissection. Both the lecture and laboratory sections of this course are oriented to students in the health professions.

### **73.204 Anatomy-Physiology**

5 Q.H.

Structure and function of the various life-supportive systems not covered in the first quarter are included. The study of the endocrine and reproductive systems concludes the course. Laboratory is devoted to basic principles involved in understanding life systems and cell function.

### **73.215 Drug Interactions**

(Prereq. Chemistry/Pharmacology III) 4 Q.H.

Drug interactions will be considered by pharmacological class. Included in the discussions will be antihistamines, antibiotics, other anti-infective agents, anti-neoplastics, parasympathomimetic and parasympatholytic agents, skeletal muscle relaxants, coumarin anticoagulants and cardiovascular agents. Included also will be some discussions of the effects of hormone therapy or action of other drugs and some consideration of physiological states (physical debilitation, pregnancy) which can alter drug response.

### **73.223 Clinical Biochemistry**

(Prereq. 90.151) 4 Q.H.\*

Electrolytes, enzymes, and hormones of clinical and pathologic interest, with experiments to interpret disordered biochemistry.

### **73.229 Pharmacology Lab I**

1 Q.H.

Application and basic principles demonstrating the pharmacological considerations of drug actions in biological systems.

### **73.230 Pharmacology Lab II**

(Prereq. 73.229) 1 Q.H.

A continuation of 73.229.

### **73.245 Introduction to Pathology**

(Prereq. 72.204, 73.223) 4 Q.H.

Basic concepts of pathology for the pharmacy student, with emphasis on disease processes and alterations of normal biochemical mechanisms.

### **73.247 Toxicology**

(Prereq. 72.244) 4 Q.H.

Principles of toxicology, including FDA requirements relating to new drugs, environmental and other factors affecting the toxicity of therapeutic agents, mechanisms of toxicity, and clinical applications.

### **73.248 Neuropharmacology**

(Prereq. 72.244) 3 Q.H.

Neurohumoral control of normal body function and the effects exerted on these systems by neurotropic agents.

### **73.293 Special Research Project/Pharmacology**

(Prereq. Permission of instructor with dean's approval) 4 Q.H.

A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.

### **73.294 Special Research Project (Pharmacology)**

(Prereq. Permission of instructor with dean's approval) 4 Q.H.

A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.

### **73.295 Special Research Project (Pharmacology)**

(Prereq. Permission of instructor with dean's approval) 4 Q.H.

A course of directed study or research in one of the pharmaceutical sciences, wherein the student may undertake "in-depth" investigation of an area of specialized interest.

## **Nursing**

### **80.101 Fundamentals of Nursing**

6 Q.H.\*

Basic to all other courses in nursing. Focus is on the patient as an individual. Underlying this is the concept of homeostasis and the role of the nurse in meeting basic needs. Nursing action is

\*Including lab.



based upon the principles drawn from the behavioral, social, and biological sciences. Assignments in patient care are designed to provide the student with opportunities to interpret these principles in the promotion of health and the prevention of illness.

**80.102 Fundamentals of Nursing** (Prereq. 80.101) 6 Q.H.\*

The major focus is the identification of common deviations from homeostasis and the supportive nursing measures involved in the restoration of the patient to normal homeostasis.

**80.103 Fundamentals of Nursing** (Prereq. 80.102) 6 Q.H.\*

The major focus is on the identification of specific long-term deviations from homeostasis and the nursing actions involved in the restoration of the patient to optimal function and adaptation.

**80.108 Introduction to Technical Nursing** 5 Q.H.\*

Focus on the role of the technical nurse as a member of the nursing team. Major emphasis placed upon the ability to provide direct nursing care through the use of the problem-solving process in developing and implementing an effective care plan, based upon principles from the biophysical, behavioral, and social sciences with broad application to nursing problems.

**80.109 Technical Nursing** (Prereq. 80.108) 2 Q.H.

Emphasis on the student's understanding of selected medical and surgical conditions and developing the ability to relate principles from biophysical and psychosocial sciences to concepts which give meaning to the nursing care of patients.

**80.110 Nursing Seminar** (Prereq. 80.108-80.109) 3 Q.H.

A scientific approach to the analysis of health problems and related medical and nursing therapy. Students present the results of independent research in class.

**80.111 Trends in Nursing** 1 Q.H.

Acquaints the student with the evolution of nursing and its role in society today. Emphasis placed on the latter in discussions of preparation for nursing responsibilities inherent in the nursing role, and events that influence nursing practice as it is today and projected for the future.

**80.201 Nursing** 3 Q.H.\*

Introduces the student to modern concepts of health, communication and interviewing techniques, group processes, and problem-solving processes.

**80.202 Nursing** 3 Q.H.\*

Introduces the student to the systems of health care delivery, role of professional nursing, regional and world health problems. The student serves as group discussion leader at least once during the quarter.

**80.203 Nursing** 3 Q.H.\*

The science of nutrition assists the student in recognizing factors influencing the formation of food habits in self and others; identifying functions of major nutrients, food sources of those nutrients and normal nutrient needs according to age groups; the exploration of health food fads and vegetarian diets; and recognizing the need for objectivity in working with individuals in meeting their needs as well as the importance of nutrition and its relationship to health.

**80.204 Nursing—Universal Needs** (Prereq. 80.201, 80.202, 80.203) 5 Q.H.\*

Basic nursing theory and application in caring for people in hospital settings. Selected universal needs of man serve as the basis for the course, and the focus is on the nursing process as it relates to meeting these needs.

**80.205 Nursing—Common Problems I** (Prereq. 80.204) 5 Q.H.\*

Exploring problems common to individuals who are unable to meet their own health needs. Clinical practice introduces skills and activities to meet the needs of patients with these common problems in general hospital settings.

**80.207 Nursing—Common Problems II** (Prereq. 80.205) 7 Q.H.\*

Physiological and psychological disturbance in illness. Emphasis on the analysis of patient problems and the nurse's role in the control of infection; pharmacology and drug therapy,

responses of body to stress, maintenance of nutrition, and patient teaching in long-term illness. Clinical laboratory experience and a weekly discussion-seminar group.

### **80.209 Transition**

9 Q.H.

The first nursing course for Registered Nurse students in the Baccalaureate Degree Program introduces the purposes and objectives of this program, and the philosophy of baccalaureate education; broadens his/her perspectives of professional nursing; provides opportunities to complement and validate, through guided and independent study, the student's knowledge of roles and role conflicts, the communication process, group dynamics and the nursing process, specifically with those patients experiencing the stresses of aging, chronic and long-term illness, and death it also provides opportunities to understand the nutritional needs of self and others with specific emphasis on the aged and chronically ill individual.

### **81.101 Medical-Surgical Nursing**

(Prereq. 80.103) 11 Q.H.\*

Utilizing the concept that all illnesses produce alterations in body function, the student is introduced to selected conditions requiring medical and/or surgical intervention. Major emphasis in classroom and clinical instruction is upon the nurse's role in meeting patients' physical and psychosocial needs, further developing nursing techniques, and learning specific skills needed to care for assigned patients.

### **81.102 Medical-Surgical Nursing**

(Prereq. 81.101) 7 Q.H.\*

Designed to broaden the student's understanding of adults with more serious forms of physical illness. The content has been developed to present the nurse's responsibilities in caring for patients with alterations in physiologic functions and body image. Classroom and clinical experiences focus on principles and nursing skills that are involved in providing complex care for selected patients.

### **81.201 Medical-Surgical Nursing**

(Prereq. 80.207) 9 Q.H.\*

Focuses on selected physiologic problems encountered in the care of adult patients. Guided clinical experiences are planned, with special emphasis on the effects of illness on the individual's pattern of living, continuity of care, and health teaching. Classroom and clinical experiences focus on the knowledge and skills necessary to plan and implement comprehensive health care.

### **82.101 Maternal and Child Health**

(Prereq. 19.141, 19.142, 80.103) 12 Q.H.\*

Focuses on the family and the individual and their developmental task, with emphasis on positive health practices within the family unit. The nursing approach centers upon the health needs of mothers and children of all ages. The needs of the hospitalized child are identified by studying the effect of illness upon his normal growth and development. The common illnesses of childhood are discussed.

### **82.201 Maternal and Child Nursing**

(Prereq. 80.207, 19.141) 9 Q.H.\*

Focuses on the nursing needs of mothers and children. Experiences are provided in selected maternity and pediatric settings. Emphasis is given to the role of the nurse as a health teacher. Exploration is made of the present-day problems relating to maternal and child welfare and their implications to nursing.

### **83.101 Psychiatric Nursing**

(Prereq. 81.101, 82.101) 6 Q.H.\*

Assists the student to acquire additional knowledge of human behavior; to provide the opportunity to achieve understanding of selected human motivations and defenses; and to learn additional interpersonal skills which may be used in the nursing care of patients. The opportunity to apply this knowledge, to observe and analyze behavior, and to practice skills is offered in supervised laboratory sessions.

### **83.201 Psychiatric-Mental Health Nursing**

(Prereq. 80.207) 9 Q.H.\*

Designed to increase and develop knowledge of mental illness, understanding of the dynamics of human behavior, and the interrelationship of theory and practice as it applies to clinical and community aspects of mental health and psychiatric nursing.

### **84.201 Public Health Nursing**

(Prereq. 81.201, 82.201, 83.201) 9 Q.H.\*

Increases understanding of the variety of ways in which communities organize to meet the

health and welfare needs of their members. Principles of public health and public health nursing are examined in-depth. Attention is given to current health and welfare legislation, environmental factors affecting health, and the role of the nurse in prevention of disease and maintenance of health. Laboratory experiences provide opportunities to work with individuals, families, and community agencies.

### **85.201 Contemporary Nursing**

(Prereq. 84.201) 9 Q.H.\*

The final nursing course before graduation. Includes lectures, seminars, progress reports, and eight weeks of student-selected placement experience. The core content includes legal aspects, roles, leadership, change, and research methods. Students demonstrate self-direction by defining their objectives for placement experience, pursuing an area of nursing in which they are particularly interested, utilizing basic principles of research, and evaluating their own performance.

## **Allied Health Professions**

### **General Courses**

### **86.102 Hospital Law**

2 Q.H.

An analysis of the legal principles relating to medical and paramedical practice within a hospital environment. The common law and statutory rights of the hospital, practitioner, and patient are discussed.

### **86.103 Basic Medical Terminology**

2 Q.H.

A study of the language of medicine and health care. Emphasis is on disease, procedurals and symptomatic terms and their definitions, word construction and analysis and application of same. The student acquires a working knowledge of medical terminology.

### **86.107 Medical Terminology**

4 Q.H.

A study of the language of medicine, including prefixes, suffixes, roots, abbreviations, disease and operative and drug terms. Also included are terms related to all area specialties. The terms are studied as they relate to a specific system of the body.

### **86.112 Foundations of Medical Science I**

3 Q.H.

Major disease problems in our society and modes of treatment. Discussion of organized care, diagnosis, and treatment. Consideration of reproduction, birth, and pediatrics.

### **86.113 Foundations of Medical Science II**

(Prereq. 86.112) 3 Q.H.

A continuation of 86.112 covering heart, cancer, stroke, blood and lymphatic diseases, accidents, and musculoskeletal, respiratory, and gastrointestinal diseases.

### **86.160 Introduction to Data Processing for the Health Sciences**

4 Q.H.

This is an introductory course designed to introduce the student to the basic concepts of electronic data processing. Topics considered include: input, output, storage, computation, and controls. The basic history of automation is reviewed. The concept of computer language is introduced utilizing FORTRAN. Simple problems are completed on an individual and group basis.

### **86.170 Health, Disease, and Disability**

(Prereq. 86.113) 4 Q.H.

The purpose of this course is to deepen the student's understanding of altered physiologic states that are caused by trauma, disease and stress. Particular emphasis is placed upon the interdisciplinary management of acute illness with the objective of correcting defects and supporting life systems.

### **86.174 Health, Disease, and Disability I**

3 Q.H.

Major disease or disability states and their impact on human physiology and psychology. Social and individual response to these states. Lectures, demonstrations, field visits. Part I emphasizes medical areas.

**86.175 Health, Disease, and Disability II**

(Prereq. 86.174) 3 Q.H.

A continuation of 86.174. Part II emphasizes surgical areas.

**87.131 Dynamics of Health Care I**

1 Q.H.

Orientation of the Allied Health Profession student to the history and organization of health care in the United States, with an introduction to the roles of the health-care team members.

**Medical Laboratory Science***The Medical Laboratory Science professional courses are taught by University faculty, together with supportive clinical faculty.***87.100 Laboratory Medicine—Orientation**

1 Q.H.

The history and development of the medical laboratory technologies and pathology.

**87.101 Basic Medical Laboratory Science** (Prereq. 18.132, 12.104, or 12.107) 4 Q.H.\*

Introductory course in the basic medical laboratory sciences: methods, principles, theories.

**87.102 Basic Medical Laboratory Hematology** (Prereq. 81.101) 2 Q.H.\*

Principles and procedures of basic medical laboratory hematology, including basic coagulation.

**87.103 Basic Medical Laboratory Immunohematology** (Prereq. 87.101) 2 Q.H.\*

Basic principles in immunohematology and related techniques, with particular emphasis on those procedures used in blood banking.

**87.104 Basic Medical Laboratory Science Clinical Microbiology** 4 Q.H.\*

Basic principles and techniques of organism isolation, cultivation, and identification from clinical specimens. Elementary serologic procedures will be discussed.

**87.105 Basic Medical Laboratory Chemistry and Instrumentation** (Prereq. 87.101) 4 Q.H.\*

Principles, procedures, and techniques of basic clinical chemistry and instrumentation.

**87.106 Basic Electronics and Medical Laboratory Science Instrumentation I**

(Prereq. 11.171, or concurrently, 87.105) 1 Q.H.

This course is designed to teach the student the fundamental electronics pertaining to clinical laboratory instruments, the proper operating procedures and maintenance of each instrument.

**87.107 Basic Electronics and Medical Laboratory Science Instrumentation II**

(Prereq. 11.172 or, concurrently, 87.105) 1 Q.H.

Further study of clinical instrumentation and electronics. Trouble shooting and minor repairs of the instruments according to the manufacturer's standards will be taught. Students will be familiarized with instrument and procedure manuals currently required in a large clinical laboratory.

**87.111 Medical Microbiology Applied Study (At Hospital)** (Prereq. 18.220, 87.101) 4 Q.H.

Clinical practicum in applied microbiology at an affiliated accredited hospital school of medical technology.

**87.112 Hematology and Immunohematology Applied Study (At Hospital)**

(Prereq. 87.102, 87.103) 4 Q.H.\*

Clinical practicum in applied hematology, coagulation, and blood banking at an affiliated accredited hospital school of medical technology.

**87.115 Medical Laboratory Chemistry Applied Study (At Hospital)**

(Prereq. 12.145, 12.171, 87.105) 4 Q.H.\*

Clinical practice in applied clinical chemistry at an affiliated accredited hospital school of medical technology.

**87.120 Communications in the Health Sciences**

3 Q.H.

Effective communication in the medical scientific community.

- 87.121 Quality Control** (Prereq. 12.171, 10.105, 87.101, 87.105) 2 Q.H.  
Basic statistical methods used in medical laboratory quality control.
- 87.141 MLT Applied Study in Clinical Microbiology**  
(Prereq. 87.100, 87.101, 87.102, 87.103, 87.104, 87.105 and acceptance into AD-MLT Clinical Program.) 2 Q.H.  
Clinical practicum in microbiology at a Northeastern University affiliated hospital providing AD-MLT (ASCP) level instruction.
- 87.142 MLT Applied Study in Hematology**  
(Prereq. 87.100, 87.101, 87.102, 87.103, 87.104, 87.105 and acceptance into AD-MLT Clinical Program.) 2 Q.H.  
Clinical practicum in hematology and coagulation at a Northeastern University affiliated hospital providing AD-MLT (ASCP) level instruction.
- 87.143 MLT Applied Study in Blood Banking**  
(Prereq. 87.100, 87.101, 87.102, 87.103, 87.104, 87.105 and acceptance into AD-MLT Clinical Program.) 2 Q.H.  
Clinical practicum in blood banking at a Northeastern University affiliated hospital providing AD-MLT (ASCP) level instruction.
- 87.145 MLT Applied Study in Clinical Chemistry**  
(Prereq. 87.100, 87.101, 87.102, 87.103, 87.104, 87.105 and acceptance into AD-MLT Clinical Program.) 2 Q.H.  
Clinical practicum in clinical chemistry and urinalysis at a Northeastern University affiliated hospital providing AD-MLT (ASCP) level instruction.
- 87.180 MLT Seminar I**  
(Prereq. 87.100 through 87.105 and acceptance into AD-MLT (ASCP) Clinical Applied Study.) 2 Q.H.  
Basic introduction to correlation of laboratory findings in hematology, blood banking, microbiology and clinical chemistry and appropriate referrals of laboratory information in working situation. Basic use of quality control.
- 87.181 MLT Seminar II** (Prereq. 87.180) 2 Q.H.  
Continuation of 87.180 and introduction to select new laboratory techniques. Emphasis on the role of the AD-MLT (ASCP) technician in a working laboratory.
- 87.190 Undergraduate Research** (Prereq. 87.102, 87.103, 87.105) 2 Q.H.  
Special problems in laboratory medicine involving individual research under the direction of a faculty member.
- 87.201 Pathogenic Microbiology** (Prereq. 18.220 and 87.101) 4 Q.H.\*  
Methods of identification and differentiation of normal and pathogenic body flora. Basics of virology; fundamentals of mycology and mycological infections.
- 87.202 Hematology and Immunochemistry** (Prereq. 18.132, 87.102, 87.103) 4 Q.H.\*  
Review of hemopoiesis morphology and physiology of blood cells and bone marrow. Basic lectures with complementary clinical pathology conferences; discussions on current literature and applied laboratory experiences.
- 87.203 Medical Immunology and Serology** (Prereq. 87.201, 87.103) 2 Q.H.\*  
Medically applied immunological and serological concepts and procedures.
- 87.204 Medical Parasitology** (Prereq. 18.220) 2 Q.H.\*  
Laboratory identification of human parasites and a study of their life cycles.
- 87.205 Clinical Chemistry** (Prereq. 12.171, 12.145, 87.101, 87.105) 4 Q.H.\*  
Principles and methodologies of current clinical chemistry procedures used in the medical laboratory for the assessment of human physiological conditions.
- 87.211 Coagulation** 3 Q.H.  
Advanced studies in coagulation factor identification and problem solving of coagulation tests. Discussion of related hematologic disorders.

**87.213 Immunohematology**

2 Q.H.

Advanced studies in antigen-antibody detection and problem solving of immunohematological tests. Discussion of related hematologic disorders, and the medical/legal aspects of blood banking.

**87.221 Medical Laboratory Management**

2 Q.H.

Principles of laboratory supervision, communication, and personnel relations. Professional ethics, relationships, and legal responsibilities.

**87.222 Histochemistry (of hemic cells)**

3 Q.H.

The histochemistry and electronmicrography of hemic cells and the use of these techniques in diagnosis of hematological disorders.

**87.226 Medical Laboratory Science Education**

2 Q.H.

Use, evaluation, and development of educational media with particular emphasis on correlation of didactic and clinical instruction.

## **Medical Records Administration**

**86.151 Medical Record Science I**

(Prereq. Two years of liberal arts) 4 Q.H.\*

Introduction to medical records; history of the medical record and medical record forms. A study of the professional medical record administrator and his relationship to the health facility. Medical staff and committees in hospital. Quantitative analysis of medical records.

**86.152 Medical Record Science II**

(Prereq. 86.151) 4 Q.H.\*

The numbering, filing, securing, and preserving of medical records. Principles of law as related to patient care and medical records. Study and practice of medical transcription. The rules of privileged communications and the release of information to agencies are stressed.

**86.153 Medical Record Science III**

(Prereq. 86.152) 4 Q.H.\*

Basic principles of compiling statistics for hospital and other health institutions. Includes the preparation of the daily census, discharge analysis, monthly, annual, and special reports. Birth and death certificates are included. Principles of Standardized Nomenclature of Diseases and Operations and International Classification of Disease, adapted - 8. Study of other indexes used in medical records departments.

**86.154 Advanced Medical Record Science IV**

(Prereq. 86.153) 4 Q.H.\*

Advanced aspects of medical record science. Includes developing of forms and forms control, planning and managing, and new record systems; advanced aspects deal with statistics and consulting in extended-care facilities and nursing homes.

**86.161 Quality Assurance**

(Prereq. 86.153-154, 86.107 or permission of instructor) 4 Q.H.

This course is designed to give the student the knowledge of the issues and problems involved in designing, implementing and maintaining quality assurance programs for health care facilities. The student will also gain the technical skills necessary to carry out all aspects of the audit process. Their role as facilitator to physicians and other professional staff will be stressed.

**86.162 Management Principles in Health Care**

4 Q.H.

This course is an introduction to basic management principles. It is designed so that the hospital (or health care facility) will be the major source of example and case study. This approach will enable the student to synthesize abstract principles with practical application.

**86.163 Systems Analysis, Health Oriented**

(Prereq. 86.162) 4 Q.H.

This course is designed to give the Medical Record Student an introduction to systems analysis, its concepts and techniques. Specific application to Health Record Management is stressed throughout the course.

**86.164 Special Topics I**

2 Q.H.

Specialized study in Medical Records.

- 86.165 Special Topics II** 2 Q.H.  
Specialized study in Medical Records.
- 86.166 Applied Health Statistics** (Prereq. Basic Statistics course) 4 Q.H.  
This course is designed to teach the Medical Record student how to apply basic statistical techniques to the gathering, analysis and interpretation of Health Care and Medical Record Data. The student will learn how to use these tools effectively in such areas as Departmental Management, and Research Studies. Agencies involved in collecting statistical data will be reviewed, and the types and sources of the information they require, the relationship of statistics, epidemiology and medical records will be considered.
- 86.168 Medical Computer Applications** (Prereq. EDP Course I) 4 Q.H.  
Utilization of Electronic Data Processing in the Health Care milieu. Overview of current activities and their impact on future trends in Medical Record Management information will be discussed. The role of the RRA as an information specialist will be considered.
- 86.169 Independent Study** (Prereq. See instructor) 4 Q.H.  
This independent study project is designed to give students an opportunity to explore in depth a subject relevant to their interests. It is designed to give them the opportunity to study a problem, present a proposal, carry out a study or a course of action, and to prepare both written and oral presentations of their activity.
- 86.257 Organization and Management of Medical Records Department I** 4 Q.H.  
The study of the hospital, patterns of organization with hospitals, lines of responsibility and authority, medical staff and administrative organization, hospital departmental functions and organization. The study of fundamental principles and successful practices in getting office work accomplished. Office management problems and their solution, conceptual framework for the operation of essential management function, facilities, solutions, and contributions of the office.
- 86.258 Organization and Management of Medical Records Department II** 4 Q.H.  
The study of the development of an efficient medical records department in any medical care facility; application of the principles of organization and management in the development and administration of a system of medical information handling.
- 86.262 Applied Medical Records Science Directed Practice I** (Prereq. 86.151) 2 Q.H.  
Clinical practicum in Medical Records Science in the general hospital.
- 86.263 Applied Medical Records Science Directed Practice II** (Prereq. 86.262) 3 Q.H.  
Clinical practicum in Medical Records Science in the hospital setting.
- 86.264 Applied Medical Records Science IV** 4 Q.H.  
Clinical practicum in medical records management in the health care facility.

## Respiratory Therapy

- 86.201 Professional Practice Laboratory I** (Prereq. 86.221 concurrently) 1 Q.H.  
This lab is designed to provide practice of basic care skills through laboratory exercises and simulation of patient care situations.
- 86.202 Professional Practice Laboratory II** (Prereq. 86.201, 86.222 concurrently) 1 Q.H.  
The lab is designed to provide hands-on experience working with respiratory therapy equipment. Simulated patient management problems will be set up in the lab to provide problem solving experience.
- 86.203 Professional Practice Laboratory III** (Prereq. 86.202, 86.223 concurrently) 1 Q.H.  
The lab is designed to provide hands-on experience working with respiratory therapy equipment. Simulated patient management problems will be set up in the lab to provide problem solving experience.
- 86.204 Professional Practice Laboratory IV** (Prereq. 86.203, 86.224 concurrently) 1 Q.H.  
The lab is designed to provide hands-on experience working with respiratory therapy

equipment. Simulated respiratory care problems will be set up in the lab to provide problem solving experience.

**86.205 Cardiopulmonary Laboratory Practice** (Prereq. 86.225 concurrently) 1 Q.H.  
This course is designed as the laboratory portion of Cardiopulmonary Laboratory Technology. Focus is placed on the techniques of pulmonary functions testing, blood gas analysis and cardiovascular testing commonly done in the clinical setting.

**86.209 Clinical Practice I** (Prereq. 86.202, 86.203 concurrently) 4 Q.H.  
This is the first course to provide clinical experience in hospitals. Focus is on respiratory care for non-critical patients. Emphasis is placed on infection control, medical gas administration, humidification of medical gases, aerosol therapy, chest physiotherapy, deep breathing treatments, and the administration of aerosol medications.

**86.210 Clinical Practice II** (Prereq. 86.203, 86.204 concurrently) 4 Q.H.  
The course is designed to provide clinical experience in hospitals. Emphasis is placed on respiratory care for critical patients. Advanced respiratory care topics such as airway care, mechanical ventilation, and positive and expiratory pressure are reviewed.

**86.211 Respiratory Therapy Seminar I** 1 Q.H.  
A survey course designed to introduce the beginning Respiratory Therapy student to the role of respiratory therapists in health care delivery.

**86.212 Respiratory Therapy Seminar II** 1 Q.H.  
A survey course designed to introduce the beginning Respiratory Therapy student to the profession.

**86.213 Respiratory Therapy Seminar III** 1 Q.H.  
A survey course designed to introduce the beginning Respiratory Therapy student to the role of respiratory therapists in health care delivery.

**86.214 Clinical Seminar I** (Prereq. 86.209 concurrently) 1 Q.H.  
The seminar is designed to discuss clinical topics and respiratory care problems encountered during clinical practice that are occurring simultaneously in the hospitals.

**86.215 Clinical Seminar II** (Prereq. 86.210 concurrently) 1 Q.H.  
The seminar is designed to discuss clinical topics and respiratory care problems encountered during clinical practice that are occurring simultaneously in the hospitals.

**86.221 Introduction to Patient Care** (Prereq. Satisfactory completion of the first year curriculum) 2 Q.H.  
This course is designed to give the student knowledge and understanding of basic patient care skills. The student will study moving and positioning patients, infection control, basic observation and assessment skills and American Heart Association cardiopulmonary resuscitation. The student will also develop his/her interpersonal and communication skills.

**86.222 Introduction to Respiratory Care** (Prereq. 86.221 and Pharmacology concurrently) 3 Q.H.  
This course is basic to all other professional respiratory therapy courses. Focus is on the theory and application of medical gas administration and humidity/aerosol therapy.

**86.223 Respiratory Care for the Medical and Surgical Patient** (Prereq. 86.222) 3 Q.H.  
This course is a continuation of the introduction to respiratory therapy. It is designed as the didactic portion of beginning clinical experience on non-critical patients. Focus is placed on respiratory care problems following major surgery and those of a more chronic nature that are related to medical patients.

**86.224 Respiratory Care for the Critical Patient** (Prereq. 86.223) 3 Q.H.  
The course is the last in a sequence of three directly related to the theory of respiratory therapy procedures. It is designed as the didactic portion of clinical experience on critical patients. Focus is placed on respiratory care problems encountered with patients in intensive care units.



**86.225 Cardiopulmonary Laboratory Techniques**

(Prereq. 86.227 and permission of instructor) 3 Q.H.

This course is designed to give the student knowledge and background in the principles, theory and procedures encountered in a clinical cardiopulmonary laboratory. Focus will be placed on the physiologic foundations of cardiopulmonary testing.

**86.226 Cardiopulmonary Physiology**

(Prereq. Satisfactory completion of the first-year courses) 4 Q.H.

This course is designed to provide a detailed introduction to the structure and function of the cardiopulmonary systems. The material will be presented emphasizing clinical relevance and application in preparation for the basic courses in the clinical sciences.

**86.227 Cardiopulmonary Disease**

(Prereq. 86.226) 4 Q.H.

This course is designed to provide a detailed introduction to the clinical diagnostic procedures employed in evaluating cardiopulmonary patients and a description of the etiology, pathophysiology, diagnosis, and treatment of major cardiopulmonary diseases.

## **Cooperative Education**

**90.251 Placement Techniques**

1 Q.H.

Career selection and development are discussed concurrently with resume preparation, interviewing techniques, and effective written communication to facilitate the planning and implementation of a professional career program.

**90.253 Professional Development for Teachers**

1 Q.H.

An examination of the following topics: analysis of the job market for teachers; role of the Education Placement Office; career opportunities in education beyond public school teaching; graduate study; and certification procedures. A discussion of resume preparation and interviewing techniques is also included.

**90.254 Professional Development for Nurses**

1 Q.H.

Personal, legal, and professional responsibilities of nursing are discussed concurrently with resume preparation, personal presentation, and effective written communication.

**90.255 Professional Development in Criminal Justice**

1 Q.H.

Career options in criminal justice are reviewed, along with the techniques of resume preparation, interviewing, and effective written communication.

**90.258 Professional Development for Engineers**

1 Q.H.

Career development in engineering is examined with a view to current practice and developing trends, along with discussion of resume preparation, interviewing techniques, and effective written communication.

## **Military Science**

**91.101 U.S. Defense Establishment**

1 Q.H.

History, organization, and mission of the Department of Defense. The mission and organization of the U.S. Army is studied with emphasis on career opportunities, future education, and individual service obligations.

**91.102 Map and Aerial Photo Reading**

(Prereq. 91.101) 1 Q.H.

Use of maps and aerial photographs to develop an understanding and an appreciation of these instruments of command and their application to the military service.

**91.103 Leadership Laboratory**

(Prereq. 91.102) 1 Q.H.

Progressive training in leadership, drill, and command. Exercise in command is stressed wherein students perform duties and functions as officers incident to conduct of training.

**91.104 American Military History**

2 Q.H.

The development of the U.S. Army from the American Revolution to the present. Selected

battles and campaigns, coupled with major periods of international crises. An appreciation of the modernization of the American military and the conduct of war.

**91.105 Officer Development Leadership Laboratory** (Prereq. 91.104) 1.5 Q.H.

The functions, duties, and responsibilities of junior military leaders and the development of leadership potential through practical exercises; discussion of the ROTC Advanced Course. Leadership laboratory as described in 91.103.

**91.112 Military Leadership** 1.5 Q.H.

An examination of the dynamics and principles of leadership. The leader's role, his duties and leader-subordinate relationships are stressed. Case studies depicting typical leadership problems will be analyzed.

**91.113 Small Unit Tactics and Teams** 1.5 Q.H.

This course introduces the fundamentals of offensive and defensive combat at the squad and platoon level. Troop-leading procedures, planning and combat orders are also stressed.

**91.114 Fundamentals and Theories of the Military Team** (Prereq. 91.112, 91.113) 1.5 Q.H.

Combined arms tactics at the company level are discussed. The organization of the unit and responsibilities of the key officers are examined in detail. Practical exercises are used to simulate actual situations with students filling leadership roles.

**91.115 Preparation for Advanced Camp** (Prereq. 91.112, 91.113 and 91.114) 1.5 Q.H.

A series of programmed and practical (e.g., map reading, physical conditioning, weapons familiarization) leadership exercises to prepare cadets for maximum individual performance at advanced camp. A portion of this course is conducted during a Field Training Exercise at Ft. Devens. This course is required in the Junior year for all cadets attending advanced camp.

**91.116 Military Law and Administration** 1.5 Q.H.

A review of the history of military law; the military judicial system, including courts martial and alternatives to courts martial; and international law governing land warfare (Geneva Conventions), focusing on legal problems encountered by, and authorities applicable to, the Junior leader. Course also includes a summary description of additional administrative duties commonly assigned to a Junior leader.

**91.117 The Psychology of Leadership** (Prereq. 91.112) 1.5 Q.H.

This course integrates basic theories of human behavior with the art of leadership and motivation. The dynamic interaction between the leader, group, situation, organization, and society will be explored in depth. Personal skills, interpersonal skills and organizational skills will be developed in experiential sessions through role playing and situational sketches.

**91.118 Management and Leadership Styles** (Prereq. 91.112) 1.5 Q.H.

Advanced management techniques and their relationship to the junior leader are examined. The individual as leader is studied. The leader's role in interpersonal relationships and the communicative process is examined at the company-sized organization level. A group process simulation game is played to look at operating problems of groups.

**91.119 Effective Written Communications** 1.5 Q.H.

This course offers practical experience in the art of organizing written material. The course is organized around the production of a staff study with emphasis on planning, research and the mechanics of writing.

**91.120 Methods of Instruction** 1.5 Q.H.

An introduction to the fundamentals of teaching and principles of learning. Emphasizing practical applications, the course will cover multimedia instructional techniques, lesson planning and training management.

**91.121 Branches of the Army** 1.5 Q.H.

A survey of the history, functions and typical duties associated with U.S. Army career branches, their interrelationship and the career opportunities available within each. The information provided will assist cadets in making branch selections.

- 91.122 Personal Management Planning** (Prereq. 91.101) 1.5 Q.H.  
An in-depth look at personal affairs of junior officers with emphasis on financial management, benefits and estate planning. The course can be used for personal planning and as a guideline for counseling subordinates.
- 91.123 Personal Management Planning II** 1.5 Q.H.  
A continuation of career planning for junior officers. The promotion system, personal management system and schooling and career opportunities are studied in depth. Senior-subordinate relationships are studied in relation to military courtesy, customs and the officer image. Additional duties of junior officers are discussed.
- 91.124 World Balance** 1.5 Q.H.  
A study of international military powers within a world of growing economic interdependence. Emphasis will be on ramifications of Third World raw materials on the military superpowers.
- 91.125 U.S. Army Combat Divisions** (Prereq. 91.113, 91.114) 1.5 Q.H.  
A study of the types of divisions, their composition, capabilities and fire power. Discussions of command and control, staff procedures, combat service support and tailoring. Also compares U.S., Soviet, and Chinese divisions.
- 91.130 Land Navigation/Map Reading** 1 Q.H.  
Use of map and compass as land navigation aids. Grid coordinates, intersection, resection, and terrain association. Introduction to orienteering.
- 91.131 Orienteering** (Prereq. 91.130) 2 Q.H.  
Orienteering as a sport. Types of orienteering, meet administration, course layout. Emphasis on orienteering techniques with student participation in several orienteering meets.
- 91.132 Leadership I** 1 Q.H.  
An introduction to the fundamentals and principles of small group leadership. Development of functions, duties, and responsibilities for small group leaders.
- 91.133 Leadership II** (Prereq. 91.132) 1 Q.H.  
Applied leadership for small groups. Application of leadership techniques and development of leadership skills through practical exercises in different environmental circumstances.
- 91.134 Rappelling** 1 Q.H.  
Instruction in the basic skills and techniques of rappelling. The course will cover the equipment, its proper use, and the basic rappelling techniques to include seat-hip, body, and hasty rappelling. Emphasis will be placed on proper knot tying and safety measures to be observed during mountain operating.
- 91.135 Marksmanship** 1 Q.H.  
Instruction in basic marksmanship techniques, safety and range commands. The course will cover regulations governing competition firing, with emphasis on the development of skills through practice.
- 91.136 Leadership III** 1 Q.H.  
Fundamentals of drill and ceremonies, military formations, and the performance of basic marching movements, with and without weapons. Voice development and correct inflection for giving commands. Opportunity for participation in civic ceremonies as part of a marching unit or honor guard. Objectives are to instill teamwork, confidence, pride, alertness, attention to detail, esprit de corps, and discipline.
- 91.137 Leadership IV** (Prereq. 91.136) 1 Q.H.  
Trick drill and ceremonies requiring accuracy and timing of marching movements. Techniques of precision drill including spins and throws are emphasized. Drill will be performed using weapons with bayonets. Opportunity for participation in competition drill meets.
- 91.138 Leadership V** 1 Q.H.  
The development and use of leadership dynamics and its characteristics in the instruction, planning and supervision needed to conduct organized physical readiness training.

**91.201 Air Force Today**

1 Q.H.

91.201 examines the role of the Air Force in the contemporary world by studying the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.

**91.202 Leadership Laboratory**

1 Q.H.

Introduction to the customs, traditions, and courtesies of the Air Force through seminars, guest speakers, and a field trip to an Air Force base.

**91.203 Air Force Today**

(Prereq. 91.201) 1 Q.H.

Continuation of 91.201, 91.203 examines the role of the Air Force in the contemporary world by studying the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.

**91.204 Leadership Laboratory**

(Prereq. 91.202) 1 Q.H.

Continues 91.202 with emphasis on the role and responsibilities of an Air Force junior officer.

**91.205 The Development of Air Power**

1 Q.H.

The course includes the development of air power from balloons and dirigibles through the peaceful employment of U.S. air power in relief missions and civic action programs in the late 1960s and the air war in Vietnam.

**91.206 Leadership Laboratory**

(Prereq. 91.204) 1 Q.H.

Emphasizes the development of techniques used to direct and inform. Students are assigned leadership and management positions in the 91.202 programs described above.

**91.207 The Development of Air Power**

(Prereq. 91.205) 1 Q.H.

Continuation of 91.205. The course includes the development of air power from balloons and dirigibles through the peaceful employment of U.S. air power in relief missions and civic action programs in the late 1960s and the air war in Vietnam.

**91.208 Leadership Laboratory**

(Prereq. 91.206) 1 Q.H.

Continues 91.206. Adds a special program in preparation for Field Training.

**91.209 National Security Forces in Contemporary American Society**

4 Q.H.

91.209 is composed of academic study and a leadership laboratory. The academic portion of the course includes: an examination of military professionalism and existing patterns of civil-military relations; an analysis of the international and domestic environments affecting U.S. defense policy; an examination of the post WWII development of defense strategy and the methods of managing conflict; and an extensive study of the manifold variables involved in the formulation and implementation of national security policy. Within this structure, continued attention is given to developing the communicative skills required of junior officers.

**91.210 Leadership Laboratory**

(Prereq. 91.208) 1 Q.H.

Supervisory practice and exercise of leadership functions in controlling and directing activities of the cadet corps. Development of leadership potential in a practical, supervised training laboratory, which typically includes field trips to Air Force installations.

**91.211 National Security Forces in Contemporary American Society**

(Prereq. 91.209) 4 Q.H.

91.211 is composed of academic study and a leadership laboratory. The academic portion of the course includes: an examination of military professionalism and existing patterns of civil-military relations; an analysis of the international and domestic environments affecting U.S. defense policy; an examination of the post-WWII development of defense strategy and the methods of managing conflict; and an extensive study of the manifold variables involved in the formulation and implementation of national security policy. Within this structure, continued attention is given to developing the communicative skills required of junior officers.

**91.212 Leadership Laboratory**

(Prereq. 91.210) 1 Q.H.

Continues 91.210 emphasis on supervisory and leadership skills. Provides staff training experience through a class project requiring a written report.

**91.213 Air Force Management and Leadership** 4 Q.H.

A study of management from the point of view of the Air Force junior officer. Within this framework have been integrated the subjects of military leadership and military law. Attention is devoted to the progressive development of the communicative skills needed by junior officers.

**91.214 Leadership Laboratory** (Prereq. 91.212) 1 Q.H.

Exercise of management functions in planning, supervising and directing cadet corps activities to acquire proficiency in military leadership skills.

**91.215 Air Force Management and Leadership** (Prereq. 91.213) 4 Q.H.

Continues 91.213. Provides general theory and practice of management with special reference to Air Force application. Introduction to information systems, quantitative approaches to decision-making and resource control techniques.

**91.216 Leadership Laboratory** (Prereq. 91.214) 1 Q.H.

Continues 91.214. Includes preparation for professional duties.

## **Criminal Justice**

**92.104 Administration of Criminal Justice** 4 Q.H.

Surveys the entire contemporary criminal justice system from the initial contact with the offender through prosecution, disposition, incarceration, and release to the community. Emphasis is placed on major systems of social control: police, corrections, juvenile justice, mental health systems, and their policies and practices relative to the offender. A balance is maintained in providing legal, empirical, and sociological materials.

**92.110 Police-Community Relations** (Prereq. 92.131, 92.115, 92.132/Seniors) 4 Q.H.

Police-public contact; uses of the communications media in projecting the police image; responsibilities of police in dealing effectively with minority groups, civil rights, civil disorder, and public protection. An exploration of the role and function of the police in intergroup relations.

**92.115 Police Operations** (Prereq. 92.131) 4 Q.H.

A general survey of police operational procedures, including patrol, traffic, interrogations, and report writing. Roleplaying is used extensively to demonstrate interviewing methods.

**92.130 Criminalistics I** 4 Q.H.

Criminal investigation dealing with areas of investigation, case preparation and applied physiology.

**92.131 Law Enforcement Administration and Management** 4 Q.H.

The principles of police organization, administration, and management, including staff and line functions, chain of command, span of control, selection of personnel, and promotional systems. Consideration is also given to special problems such as strikes, natural and atomic disasters, narcotic traffic, and vice control.

**92.132 Police Supervision** 4 Q.H.

The police supervisor's role in discipline, intradepartmental relations, problem-handling and personnel policies. Problems relating to supervisory relationships, wages, grievances, morale, and safety.

**92.134 Constitutional Problems I** 4 Q.H.

In this required course, the students are exposed to the historical evaluation of the 14th Amendment and how it has been used to make most of our Bill of Rights applicable to the states. We also detail the problems of the Fifth and Sixth Amendments as they affect basic police practices and either expand on the Sixth Amendment right to counsel problems or delve into the Fourth Amendment question of illegal search and seizure. This course is also taught on the traditional case method and the students are required to know not only the concepts but how they have changed over the years and to cite cases which they believe to be precedent for conclusions they reach.

**92.137 Criminology**

4 Q.H.

Patterns and evolution of criminal behavior, the social forces involved, and development of the individual criminal; administration of criminal justice; law, courts, police, prisons.

**92.138 Juvenile Delinquency and Youth Crime**

(Prereq. 92.137 or equiv.) 4 Q.H.

The sociological and psychological approaches and their implications for a typology of delinquency; problems of prevention, treatment, and rehabilitation.

**92.139 Theories in Penology**

(Prereq. 21.100 and 92.137) 4 Q.H.

A philosophical approach to the development of punishment in the United States as examined in a historical context. Issues of justice and morality are considered as they are manifested in contemporary penal structure. Readings include selections from 18th, 19th, and 20th century novelists, philosophers, and criminologists.

**92.140 Criminalistics III**

(Prereq. 11.113, 114 or 18.114, 115 or 12.139, 12.140 or equiv.) 4 Q.H.

A course in the examination and behavior of fire. Deals with fire-related phenomena such as convection, radiation, contact, and ignition. This embodies consideration of arson, explosions, asphyxiation, and combustibility. The engineering is dealt with in terms of fireproofing agents such as plastics, textiles, building materials, and the chemistry of the halogens. Finally, some time is given to areas of fire experimentation and the potential for more sophisticated inquiry.

**92.141 Criminal Law**

4 Q.H.

This course deals with the area of criminal responsibility, some of its limitations and certain modifications substantially affecting it. The course requires an ability to express in writing both the knowledge of a particular concept as well as the ability to identify it in a complex fact pattern and discuss its implications and ramifications.

**92.142 Constitutional Problems II: The Courts and the Accused**

4 Q.H.

Rules of evidence, principles of exclusion, evaluation and examination of evidence and proof, competency, consideration of witnesses. Fundamentals of courtroom procedure, testifying in court, the principles of prosecuting a case, the introduction of evidence. Roleplaying is used as a learning device in mock trials. Class members are required to attend and report on criminal trials.

**92.143 Criminalistics II**

4 Q.H.\*

A survey of the elements of microscopy, spectroscopy, and basic chemistry as they apply to the study of firearms, hair, fibers, blood, paint, tools, glass, documents, laundry marks, poisons, and other materials which comprise physical evidence.

**92.147 The Administration of Juvenile Justice**

(Prereq. 21.100, 92.137) 4 Q.H.

Course work examines the juvenile court: its philosophy, procedure, and personnel. Focus is on the discretionary processes by which juveniles are labelled delinquent, dependent and neglected. The roles played by police, prosecution, defense, bench, and social service workers are considered. Field visits arranged.

**92.148 Probation and Parole**

(Prereq. 21.100) 4 Q.H.

Examines the nature and problems of correctional field service, both adult and juvenile.

**92.149 Alternatives to the Incarceration of Juvenile Offenders**

4 Q.H.

Examines the concept of juvenile justice in terms of the alternatives to and the negative consequences of institutionalization of juvenile offenders. Examines diversion from court, probation, crisis centers, halfway houses and other alternatives. Includes examination of sanctions imposed on youth and the role of the various "arms" of the "justice system."

**92.155 Seminar in Law Enforcement**

(Prereq. 92.131, 92.115, 92.132 Juniors/Seniors) 4 Q.H.

An opportunity for free discussion about the numerous problems facing the law enforcement officer. Periodic oral and written reports are required. Guest lecturers are invited to participate in and lead discussion sessions. An effort is made to have each student formulate his own philosophy of law enforcement prior to his graduation.

**92.156 Seminar in Law and Criminal Justice**

(Prereq. 92.141, 92.134 Juniors/Seniors) 4 Q.H.

**92.157 Research Methods in Criminal Justice**

4 Q.H.

Development of research design of the kind most useful to criminal justice problems; understanding of some of the most important issues and problems facing researchers in the field; use of various data collection methods including observation, interviewing, questionnaire construction, and scales for survey analysis; validity and reliability; computer application in criminal justice.

**92.160 Social Welfare Problems in Criminal Justice**

(Prereq. all first year requirements) 4 Q.H.

A critical examination of culture-of-poverty themes; a brief study of the social welfare system, state and federal structures, and a comparison with the social welfare systems of other nations; development of techniques for referral to social agencies; development of self-awareness through thoughtful evaluation of personal bias and experience.

**92.166 Casework and Counseling in Criminal Justice**

(Prereq. 92.160) 4 Q.H.

This course is designed to acquaint students with the psychodynamics of adolescent behavior and teach them very rudimentary techniques of casework especially useful in counseling adolescents but applicable for work with any client.

**92.167 Correctional Institutions**

(Prereq. 92.139) 4 Q.H.

An analysis of the organization and administration of correctional institutions.

**92.168 Crime and Social Defense**

(Prereq. 92.104, 21.100 or equiv.) 4 Q.H.

This course examines the problems of crime and its control from a comparative perspective. Countries such as Soviet Russia, China, France, East- and West-Germany. Great Britain, Holland, Finland, and Sweden will be analyzed, in terms of their incidence and type of deviance and crime, as well as in terms of their approach to social control and the prevention of crime. Points of divergence between these countries and the United States will be examined, with regard to their perceived causes of crime, and their differing approaches to rehabilitation and crime prevention.

**92.191, 92.192, 92.193, 92.194 Directed Study**

(each) 4 Q.H.

**92.209 The Female Offender**

(Prereq. 21.100 and 92.137) 4 Q.H.

The course addresses itself to the female at the various stages in the criminal justice system, from commission of a crime to parole. Both the juvenile and adult offender are studied. The thrust of the course is a critical analysis of existing theory and research on the female offender, with emphasis on the socialization, roles, and social participation of society at large. The male offender is also considered at each level in a comparative sense.

**92.210 Topics in History of Criminal Justice**

4 Q.H.

An historic survey of the principles of criminal justice in the ancient and medieval periods, with emphasis upon the impact of religion and philosophy.

**92.211 Topics in History of Criminal Justice**

4 Q.H.

A continuation of the historic survey with an examination of the effect of the Renaissance, Reformation and the rise of nation states.

**92.215 Stigma and Justice**

4 Q.H.

Student introspection and articulation of ideas will be encouraged and expected in this course which will examine the history, theory and reality of social and legal problems faced by those who are stigmatized. The effect of stigmatization, and the possibility of re-integration of offenders, ex-offenders, mental patients, ex-mental patients, men and women "on the street," addicts, alcoholics, the physically ill or disfigured, dishonorably discharged veterans, etc., will, be analyzed in the course. The major focus will be directed toward an examination of how the Criminal Justice System stigmatized its clientele and how, in turn, some people who are stigmatized by society are much more prone to being clients of Criminal Justice.

**92.287 Community Service Practicum**

(Prereq. 92.160 and 92.166) 6 Q.H.

The course is designed as a series, to be elected in successive quarters, or to be interrupted by cooperative work assignments. The Community Service Practicum simultaneously

involves the undergraduate student in: counseling; casework; delivery of services to a client; and creation, development and administration of a model agency. This is a real situation: the University annually renews a contract (which is written by undergraduate students in the Community Service Practicum) with the Commonwealth of Massachusetts; the contract specifies that the University will deliver day care services to the Department of Youth Services through the model agency, The Community Services Practicum. Each undergraduate assumes responsibility for fulfilling the terms of the contract as a counselor and administrator in the agency.

**92.288 Community Service Practicum**

(Prereq. 92.287) 6 Q.H.

The course is designed as a series, to be elected in successive quarters, or to be interrupted by cooperative work assignments. The Community Services Practicum simultaneously involves the undergraduate student in: counseling; casework; delivery of services to a client; and creation, development and administration of a model agency. This is a real situation: The University annually renews a contract (which is written by undergraduate students in the Community Services Practicum) with the Commonwealth of Massachusetts; the contract specifies that the University will deliver day care services to the Department of Youth Services through the model agency, The Community Service Practicum. Each undergraduate assumes responsibility for fulfilling the terms of the contract as a counselor and administrator in the agency.

## **Interdisciplinary Courses**

**93.110 Programming Computers with FORTRAN**

(Prereq. One year college math.) 4 Q.H.

Techniques for programming problems on any large computer. Emphasis is on general programming methods using the language of FORTRAN. A large number of sample problems are presented in an effort to display the applicability of computers to a wide variety of professional activities. No prior computer experience is required.

**93.111 Advanced FORTRAN Programming**

(Prereq. 93.110) 4 Q.H.

Higher-level aspects of the FORTRAN language are considered. Topics covered include: the use of software packages, the manipulation of large data arrays, processing of non-numeric information, magnetic tape operations, and data file management. An introduction to systems analysis is presented, with emphasis on Monte Carlo and queuing simulation techniques.

**93.112 Assembly Language Programming**

(Prereq. Knowledge of some compiler language) 4 Q.H.

The unique programming concepts encountered in assembly language programming. Course content includes: number system theory, internal machine representation of information, complement arithmetic, basic machine language programming, assembly language instructions, concepts of addressing, subroutine linkage, character manipulation, floating vs. fixed point operations.

**93.113 Computers for the Social Sciences**

4 Q.H.

Simple FORTRAN is covered only to the point where students can solve elementary original problems. Emphasis is then given to communicating with a discipline-oriented software package, SPSS (Subroutine Package for Social Scientists), to show how computers solve problems peculiar to the social scientist.

**93.120 An Analysis of American Racism**

4 Q.H.

A seminar in contemporary aspects of racism in America. The cycle by which racism in our institutions helps form our attitudes, and how our attitudes in turn shape our institutions, is studied and discussed. Emphasis is on the practical, day-to-day aspects of racism, rather than the theoretical and historical.



**93.125 COBOL Programming I**

4 Q.H.

Fundamentals of computer programming in COBOL. Topics include: elementary computer functioning, program organization, input/output operations, arithmetic and data-handling verbs, and program logic development through the use of flow charts. Storage and manipulation of large data files on magnetic tape are introduced. No prior computer experience is required.

**93.126 COBOL Programming II**

(Prereq. 93.125) 4 Q.H.

Higher-level aspects of the COBOL language are considered. Use of decision tables in development of program logic. Improving program efficiency. Error detection and minimization techniques. Bulk data storage in magnetic tape and disc files. Storing, merging, updating, sorting, and purging of data files. Report generation.

**93.151 General Biochemistry**

(Prereq. Two quarters organic chemistry) 4 Q.H.

Introduction to biochemical compound types, occurrence, chemistry, and introduction to metabolism.

**93.152 Physical Biochemistry**

(Prereq. 93.151) 4 Q.H.

Bioenergetics, enzymes, and enzyme kinetics, with application to central area of metabolism biooxidation and reduction processes.

**93.153 Metabolic Biochemistry**

(Prereq. 93.152) 4 Q.H.

The emphasis is on the regulation of metabolic pathways, protein and nucleic acid structure, function, and synthesis.

**93.154 Introductory Biochemistry Laboratory**

(Prereq. 93.151) 2 Q.H.\*

Introduction to basic biochemical laboratory techniques and procedures used to study proteins, nucleic acids, lipids, and carbohydrates.

**93.160 American Musical Theatre**

4 Q.H.

An interdisciplinary course, taught by the departments of Drama and Music. The development of the American musical, from the *Black Crook* to *Hair* and *Jesus Christ Superstar*, as an entertainment and as a serious art form, through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loewe, and Cole Porter, are examined. Guest lecturers, recordings, films, live productions, supplement the course.

# Academic Calendar 1976-1978

## September 1976

6	Monday	LABOR DAY. University closed.
7-10	Tuesday-Friday	Final Examinations for Basic Colleges.
13-25	Monday-Saturday	Division B vacation.
16	Thursday	FALL COMMENCEMENT.
19	Sunday	First day freshmen may occupy dormitories.
27	Monday	Beginning of 1976-1977 academic year. Upper-class registration for Divisions B and C. No Basic Colleges classes today.

## October 1976

11	Monday	COLUMBUS DAY. University closed.
----	--------	----------------------------------

## November 1976

11	Thursday	VETERANS' DAY. University closed.
25-27	Thursday-Saturday	THANKSGIVING DAY recess.

## December 1976

13-17	Monday-Friday	Final Examinations for Basic Colleges.
20-31	Monday-Friday	CHRISTMAS vacation.

## January 1977

1	Saturday	NEW YEAR'S DAY. University closed.
3	Monday	Registration for upper-class Divisions A and C. Registration for freshmen (Quarter Two) at Boston Campus, Burlington Campus, and January freshmen section of Class of 1981. Beginning of Winter Quarter. Beginning of Division B work quarter. No Basic Colleges classes today.
15	Saturday	MARTIN LUTHER KING, JR.'S. BIRTHDAY. University closed.

## February 1977

21	Monday	WASHINGTON'S BIRTHDAY. University closed.
----	--------	---

## March 1977

21-25	Monday-Friday	Final Examinations for Basic Colleges.
28-Apr. 2	Monday-Saturday	Vacation period for all students in all colleges and schools (Division A vacation).

## April 1977

4	Monday	Registration for Divisions B and C students and Division A seniors. Registration for freshmen (Quarter Three) at Boston Campus, Burlington Campus, and January freshmen (Quarter Two). Beginning of Spring Quarter. Beginning of Division A work period. No Basic Colleges classes today.
18	Monday	PATRIOTS DAY. University closed.

**May 1977**

30 Monday MEMORIAL DAY. University closed.

**June 1977**

13-17 Monday-Friday Final Examinations for Basic Colleges.

19 Sunday COMMENCEMENT.

20-25 Monday-Saturday Division B vacation.

27 Monday Registration for Divisions A and D and January freshmen (Quarter Three).  
Beginning of Summer Quarter.  
Beginning of Division B work quarter.  
No Basic Colleges classes today.

**July 1977**

4 Monday INDEPENDENCE DAY. University closed.

**September 1977**

5 Monday LABOR DAY. University closed.

6-9 Tuesday-Friday Final Examinations for Basic Colleges.

12-24 Monday-Saturday Division A vacation.

15 Thursday FALL COMMENCEMENT.

26 Monday Beginning of 1977-1978 academic year. Upper-class registration for Divisions A and C. Boston and Burlington freshmen complete their registration.  
No Basic Colleges classes today.

**October 1977**

10 Monday COLUMBUS DAY. University closed.

**November 1977**

11 Thursday VETERANS' DAY. University closed.

24-26 Thursday-Saturday THANKSGIVING DAY recess

**December 1977**

12-16 Monday-Friday Final Examinations for Basic Colleges.

19-Jan. 2 Monday-Friday CHRISTMAS vacation.

**January 1978**

2 Monday NEW YEAR'S DAY Observance University closed.

3 Tuesday Registration for upper-class Divisions B and C.  
Registration for freshmen (Quarter Two) at Boston Campus, Burlington Campus, and January freshmen section of Class of 1982  
Beginning of Winter Quarter.  
Beginning of Division A work quarter  
No Basic Colleges classes today.

16 Monday MARTIN LUTHER KING, JR'S. BIRTHDAY. University closed.

**February 1978**

20 Monday WASHINGTON'S BIRTHDAY. University closed.

**March 1978**

20-24 Monday-Friday Final Examinations for Basic Colleges.

27-31 Monday-Friday Vacation period for all students in all colleges and schools  
(Division B vacation)

**April 1978**

3 Monday Registration for Divisions A and C students and Division B seniors. Registration for freshmen (Quarter Three) at Boston Campus, Burlington Campus, and January freshmen (Quarter Two).  
Beginning of Spring Quarter.

17 Monday Beginning of Division B work period  
No Basic Colleges classes today.  
PATRIOTS' DAY. University closed.

**May 1978**

29 Monday MEMORIAL DAY. University closed.

**June 1978**

12-16	Monday-Friday	Final Examinations for Basic Colleges.
18	Sunday	COMMENCEMENT.
19-23	Monday-Saturday	Division A vacation.
26	Monday	Registration for Divisions B and C and January Freshmen (Quarter Three) Beginning of Summer Quarter. Beginning of Division A work quarter. No Basic Colleges classes today.

**July 1978**

4	Tuesday	INDEPENDENCE DAY. University closed.
---	---------	--------------------------------------

**September 1978**

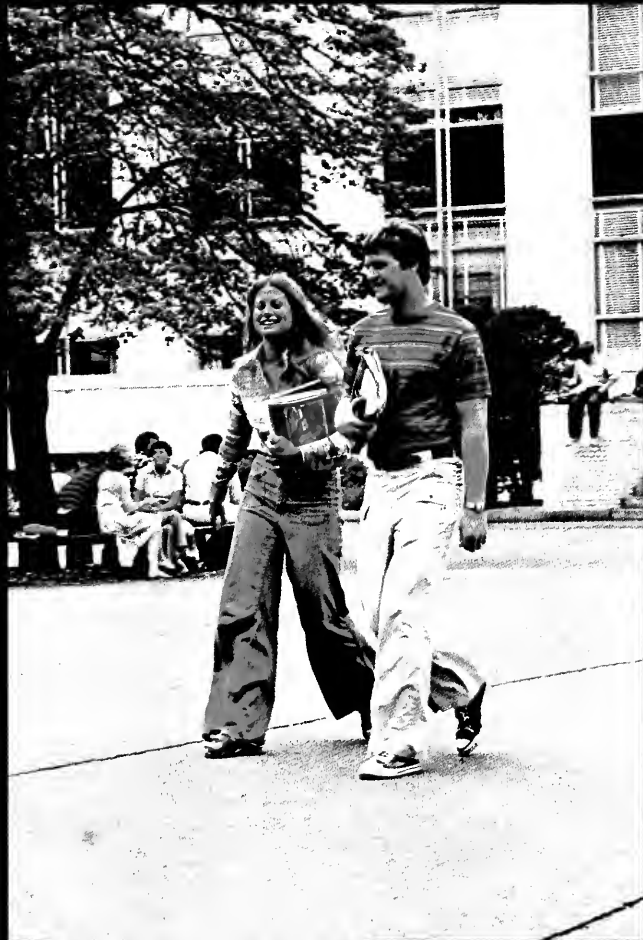
4	Monday	LABOR DAY. University closed.
5-8	Tuesday-Friday	Final Examinations for Basic Colleges.
11-23	Monday-Saturday	Division B vacation.
14	Thursday	FALL COMMENCEMENT.
25	Monday	Beginning of 1978-1979 academic year. Upper-class registration for Divisions B and C. Boston and Burlington freshmen complete their registration. No Basic Colleges classes today.





# NORTHEASTERN UNIVERSITY BULLETIN

(AUGUST ISSUE)



# 1977-1978

The Northeastern University Bulletin is issued at 360 Huntington Avenue, Boston, Massachusetts 02115, eight times a year: once in January, twice in August, once in September, once in October, twice in November, and once in December. Second Class Postage paid at Boston, Massachusetts. Volume V, Number 1, August 15, 1977.



NEW ENGLAND  
ASSOCIATION  
OF SCHOOLS  
AND COLLEGES  
ACCREDITED MEMBER

The New England Association of Schools and Colleges accredits schools and colleges in the six New England states. Membership in one of the six regional accrediting associations in the United States indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators. Colleges support the efforts of public school and community officials to have their secondary schools meet the standards of membership.



# **NORTHEASTERN UNIVERSITY BULLETIN**

**1977  
1978**

## **BASIC CATALOG**

Boston-Bouvé College  
College of Business Administration  
College of Criminal Justice  
College of Education  
College of Engineering  
College of Liberal Arts  
Lincoln College  
College of Nursing  
College of Pharmacy and  
Allied Health Professions



## **A Message from the President**

*These are interesting and exciting days in the City of Boston. Stimulated by the Bicentennial celebration, hundreds of thousands of people from all around the world continue to walk the Freedom Trail and visit such historic sites as Faneuil Hall, Old Ironsides, the Old North Church, Lexington and Concord.*

*It is my hope that you will be able to visit Boston during the upcoming year and learn more about the city and about Northeastern. The University is located in the very midst of the many cultural and historic sites where numerous special events take place. For decades now, Northeastern University has been an institution deeply committed to community service and the betterment of this unique city.*

*Through our world-famous Cooperative Plan of Education, Northeastern's undergraduate students have worked within the community of Boston and most of the other major metropolitan areas of the United States in a variety of positions which have enabled them to gain practical experience while, at the same time, they have contributed to the communities in which they work.*

*By your participating in the combination of work and study available to you after your freshman year, and in Engineering and Business Administration during the freshman year, you will find that the words "relevance" and "motivation" gain real meaning. You may be helping others, but you will also find two invaluable built-in features of the co-op plan. For one, you will be able to earn a substantial portion of your college expenses. In addition, you will be able, upon graduation, to offer a prospective employer the equivalent of two years of on-the-job-experience, a particularly important point in these days of a tight job market in many professions.*

*Even more important, Northeastern University is concerned with providing you with an education of the highest quality. You will be ex-*

*posed to an outstanding faculty, one strongly committed to you as an individual, to your development as a well rounded person, and to your development as an individual capable of clear, logical thinking, confident of your abilities, and ready to make contributions to your employers and the community.*

*At Northeastern University we have managed to attract a faculty concerned with both teaching and research, one dedicated to the passing of knowledge to young adults. More than 60 percent of the faculty possess a doctoral degree but, more importantly, as a group they possess a dedication to the teaching process and its improvement, so that you will be the beneficiary.*

*We hope to greet you in Boston and look forward to serving you should you decide to avail yourself of the many programs and services at Northeastern University.*

**Kenneth G. Ryder**

**Equal Opportunity Policy**  
Northeastern University is committed to providing equal opportunity for all. In matters involving admission, registration, and official relationships with students—including evaluation of academic performance—the university insists on a policy of nondiscrimination. Northeastern also has an equal opportunity policy as an employer. It is institutional policy that there shall be no discrimination against any employee or applicant for employment on the basis of race, color, religion, sex, age, national origin, or on the basis of being a handicapped or otherwise qualified individual. In addition, Northeastern takes affirmative action in recruitment of students and employees. Inquiries concerning our equal opportunity policies may be referred to the university Affirmative Action officer and/or the Title IX coordinator.



*This bulletin has been designed to help you plan your education and career, as well as provide the information you need to apply for admission.*

*Naturally, we are enthusiastic about what Northeastern can offer: accredited programs in an exciting urban setting, plus something special—the unique learning experience of combined work and study at the institution that developed the Cooperative Education Plan.*

*We encourage early application for admission and hope we can be of service to you.*

**Committee on Admissions**  
Department of Admissions  
Northeastern University  
Huntington Avenue  
Boston, Massachusetts 02115  
(617) 437-2200



**Tuition and Regulations**  
Tuition rates, all fees, rules and regulations, courses and course content are subject to revision by the President and Board of Trustees at any time.



# Contents

A Message from the President	2
Admissions Welcome	4
Part I About Northeastern	7
The Philosophy of Education	8
Boston and Northeastern	10
Buildings and Facilities	20
A Student's Voice	24
The Faculty—Scholars, Innovators, Advisers	26
Research	29
The Cooperative Plan	30
Alumni Association	32
Part II Academic Programs	33
Boston-Bouvé College	35
College of Business Administration	48
College of Criminal Justice	66
College of Education	69
College of Engineering	75
Lincoln College	102
College of Liberal Arts	108
College of Nursing	148
College of Pharmacy and Allied Health Professions	153
Human Services	166
Other Schools and Colleges of the University	168
Part III Particulars of Education	174
About Admissions	174
College Expenses	183
Financial Aid	187
Honor Societies and Academic Awards	203
Housing	208
Student Activities	211
Part IV General Information	221
History	222
General Information	224
Reserve Officers' Training Corps	227
Cooperative Education	231
University Libraries	236
Office of Learning Resources	238
University Health Services	239
The Center for Reading Improvement	239
The Counseling and Testing Center	240
The Computation Center	240
The Governing Boards and Officers of the University	241
Academic Calendar 1977-1978	247
Map	250
Index	251
Credits	256

# PART I



# ABOUT NORTHEASTERN

## ABOUT NORTHEASTERN

### The Philosophy of Education

Northeastern has never forgotten its original purpose: to offer an education to all qualified students who possess both the desire for additional knowledge and the determination to acquire it in spite of possible hardships.

Because Northeastern is fully aware of the importance of using all its resources to help solve monumental — and universal — social problems, its long experience in creating opportunities for productive work as a part of the total educational experience is particularly significant today. The University has also helped many members of minority groups obtain an education.

Northeastern's Boston location and the fact that it is the largest Cooperative Plan university in the world provide opportunities for student involvement in areas of national concern. For example, you as an undergraduate can have cooperative work assignments in such areas as air pollution research, rehabilitation, medical research, social service, environmental studies, and law enforcement. Student activities, too, offer a chance to "be where the action is": namely, in a wide variety of community-action programs, many of which help handicapped people, ghetto residents, and minority groups.

Today's socially conscious students often wish to continue their education on the graduate level. In response to this desire, Northeastern has extended its Cooperative Plan to some areas of graduate education. One example is the School of Law, which offers a curriculum substantially shaped around the important social issues of our time.

Many prominent educators, including those who are graduates of traditional, non-Cooperative Plan schools, are now urging that *all* college students have opportunities for on-the-job experience before graduation. These educators realize that the practical experience thus gained can strengthen college curricula.

Thus by alternating between classroom instruction and cooperative assignments, you, as a Northeastern student, are in a much better position to examine, doubt and explore than your counterpart at other educational institutions. You have the opportunity to test the opinions you have formed. You see society not for what it is, but for what it can be.





## Boston & Northeastern

Northeastern University offers you more than the traditional college education.

The University community includes people from every intellectual, political, economic, racial, ethnic, and religious background. Its location naturally attracts such a diversified student body and excellent faculty.

Newspapers, magazines, and the media have spread the word: Boston is where young people are. A mixture of Old World tradition and modern urban America, it is a city where youth can explore a rich and varied history and contribute much to social consciousness. It is the perfect college town, where the past is appreciated, the present enjoyed, and the future anticipated.

Through the Co-op Plan, Northeastern students live in the city, work in the city, and contribute to the city. They are teacher aides in ghetto schools; business administration interns in law offices and accounting firms; nursing trainees in some of the most famous hospitals in the world; engineering co-ops in outstanding corporations. In short, Northeastern students work all over Boston.









And the City—what of Boston?—where you can follow the well-worn cobblestones and bricks from Paul Revere's home to Faneuil Hall, the Common and Beacon Hill; browse in old book shops, wander through art galleries along Newbury Street; shop for food in the outdoor markets of the North End; and buy jeans for sailing along the Charles River or designer originals for an opening night at Symphony Hall or the new Boston Center for the Arts, home of the Boston Ballet and Opera Company. Everyone knows about Boston's seafood, but you can also sample Spanish, Chinese, Greek, German, Italian and French food, make the round of English pubs, and see the varied architecture of the past (State House, Back Bay, Beacon Hill), and of *now* (Government Center, Copley Square Plaza, the Prudential Center, the Christian Science Church Complex).



**Boston is the city of colleges. Boston University, Simmons College, Emmanuel College, and MIT are within walking distance of Northeastern. So are the Museum of Fine Arts, Symphony Hall, the Gardner Museum, the New England Conservatory of Music, Jordan Hall, Horticultural Hall and the Boston Public Library.**





By boarding the subway, students can easily travel to the theatre district, where pre-Broadway plays "tryout" and innovative young artists produce their own contemporary hits.











Sports fans can see four major professional teams in the Boston area. The Bruins and the Celtics play at the Boston Garden and the Red Sox play their home games within a mile of the Northeastern campus. The New England Patriots are just down the road in Foxboro and, at Longwood, you can see World Class Tennis every summer. New Hampshire and Vermont offer some of the best skiing in the country. Then, of course, there are the crew races on the Charles.

Boston is where  
Northeastern is; and  
Northeastern is Boston.



## Buildings and Facilities

The main campus of Northeastern University is located on Huntington Avenue in the Back Bay section of Boston, near the Fenway.

Northeastern's 50-acre campus is divided by Huntington Avenue, with the educational buildings on the south side and dormitories on the north.

The main educational buildings, all of which have been completed since 1938, are of glazed-brick construction in the contemporary classic style. Most are interconnected by closed passageways so that students and faculty may move from building to building under shelter during the winter months.

In Richards Hall are located some of the main administrative offices of the University, the office of the College of Liberal Arts, offices and laboratories of the Biology Department, the Departments of Philosophy, History, and Political Science, and Mechanical Engineering laboratories.

The Sarkis and Vosgitel Mugar Life Sciences Building contains the College of Pharmacy and Allied Health Professions, the Departments of Chemical Engineering and Chemical Analysis and Forensic Science, and a variety of teaching and research laboratories. Portions of both the Biology and Psychology Departments are also accommodated within the building.

Centrally located, the Dodge Library operates on an open-stack plan and is equipped to serve the varied needs of the student body. This includes the Art Gallery; an official depository for government publications and documents; and the Learning Center, which consists of the Language Laboratory, Music Listening Center and individualized television consoles.

The Carl S. Eli Student Center provides facilities for student recreation and curricular activities. The Alumni Auditorium, with a seating capacity of 1,300, is part of this building. Also included are the Music Department, the Chapel, Office of the Dean of Students, special drama facilities, a ballroom, a main lounge, fine arts areas, student offices, conference rooms, meeting areas, a student dining area seating more than 1,000, a pub, and a new patio area for socializing.

Hayden Hall contains the principal facilities of the Colleges of Engineering, Business Administration and Lincoln College. Many offices of the Graduate and Professional schools are located here, together with those of the University Registrar and other administrators. The Electrical Engineering Laboratories are housed in Hayden Hall.

University College's administrative offices are located in Churchill Hall along with the Division of Adult and Continuing Education, the Insurance Institute, and the Drama Department. Other areas of the building contain physics laboratories and, on the ground floor, the faculty and staff cafeteria.

The Godfrey Lowell Cabot Physical Education Center is one of the best equipped in New England. It contains four basketball courts, an indoor track facility and a rifle range, as well as administrative offices for the Department of Athletics and for the Physical Education Department of Boston-Bouvé College. In addition, it houses the Northeastern University Hall of Fame, and a baseball sports museum.





Mary Gass Robinson Hall contains the offices of the College of Nursing and the Departments of Physical Therapy, Rehabilitation and Special Education; nursing, biology, and physical therapy laboratories; radio and television facilities; lecture rooms, and classrooms.

The United Building complex is the location of the offices of the Departments of English, Economics, Journalism, Mathematics, Modern Languages, Psychology, Sociology, Industrial Engineering and Mechanical Engineering, and research facilities for Biology, Psychology and Mechanical Engineering. Graduate Placement Services, the International Student Office, Pediatric Nursing, the African-American Studies Department, and the Art Department and its studios are also located there.

The Charles A. Dana Research Center houses research facilities for Physics and Electrical Engineering.

The African-American Institute is a three-story structure unique because of the many varied programs and facilities located within it. The African-American Studies Department classrooms, lecture rooms, study areas and library are currently housed on the third floor. Administrative offices occupy the second floor, with the first floor equipped with recreational facilities and office space for student organizations.

Three other buildings on the campus have been completely remodeled and reconditioned for educational purposes. These are the Botolph Building, which houses the Department of Civil Engineering; the Forsyth Building, in which are located the University Health Services and the planetarium; and the Greenleaf Building, housing the Earth Sciences, Graphic Sciences, and Military Science Departments and research facilities, and the Psychology Testing Area.

A five-story structure, the Charles and Estelle Dockser Hall, contains Boston-Bouvé administrative offices, classrooms, laboratories, and faculty offices, as well as a library, dance studio, gymnasium, and recreation center.

The College of Education and its various departments are housed in Cahners and Cushing Halls along Boston's Fenway.

The Barletta Natatorium, an addition to the Cabot Center, contains a 105-foot swimming pool for instruction and intercollegiate competition, a practice tank for the rowing team, a weight room, handball courts, and shower and dressing facilities.









Devoted entirely to chemistry, the Edward L. Hurtig Hall houses classrooms and laboratories for undergraduates as well as special research facilities for graduate students and faculty. It also contains the departmental library as well as lecture halls and offices.

The Stearns Center houses the offices of the Department of Cooperative Education, the Center for Cooperative Education, the Institute for Off-Campus Experience, the Center for Secondary School Work Experience Education, The Cooperative Education Research Center and the National Commission for Cooperative Education. Several conference rooms and meetings rooms are available to serve the needs of the various departments.

Completed in 1969, the Asa S. Knowles Center is one of the University's newest buildings. It is the headquarters of the School of Law and the College of Criminal Justice.

Ethel G. and Reuben B. Gryzmish Hall, the section of the Knowles Center in which the School of Law is housed, was opened in 1970. Gryzmish Hall is a building especially designed for the School's distinctive program of legal education. It contains a law library, student lounge, moot courtroom, jury room, judge's chambers, classrooms, and offices.

John A. Volpe Hall, the second section of the Knowles Center, is the headquarters of the College of Criminal Justice. Volpe Hall was dedicated in the spring of 1972.

## A Student's Voice





Northeastern has two unique characteristics which set it apart from other schools: 1) its location, and 2) the Cooperative Plan of Education.

Boston, Massachusetts, known affectionately as the "Hub of the Universe," offers all things to all people. A city rich in historic facts and landmarks, Boston is a physical reality of the history of our nation.

Boston maintains its quaintness while offering all the advantages of a big city. Although large numbers of transient students enter and leave each fall and spring, Boston recognizes us as a stable factor. There are parks, zoos, museums, sports parks, concerts, coffeehouses, ballet, opera, puppet-shows, and theater performances; if it exists, Boston's superb cultural center will offer it.

In turn, the Cooperative Plan of Education (co-op) offers students the unique opportunity to test out and experience their chosen occupation *before* graduation. Many times a student will study, graduate, and enter a field, realizing too late that it is not a field in which he/she chooses to remain.

Northeastern University has over the years built a reputation of supplying local, national, and international businesses with bright, qualified, level-headed students to fill co-op work assignments. This ideal situation provides students with an opportunity to apply what they have learned in class in a job where they can work their way up. The types of jobs available and the salaries offered vary with major, year, and grades. It should be noted that the best jobs generally go to students who have earned the highest marks. A prospective employer uses grades as a way of determining if you will be reliable and diligent in your job.

No student should feel a job is beneath his/her talents. Rather, we are all students who are constantly learning, and any job serves as a training ground. It is up to the individual to seek and find those qualities most beneficial to their development.

The Experiential Program offered through the Co-op Department enabled me to participate in the Presidential Campaign of Congressman Mo Udall this past year. I traveled with the campaign for three months and thrived on the grueling schedule. Beginning as a field co-ordinator, I earned the responsibility of coordinating a district office. The experience has proven invaluable.

Academics at Northeastern offer both a scholarly and a practical approach to education. The courses which I have taken as a political science major have equalled my expectations. The faculty arrange conference hours, so that they will be accessible to students who need extra help.

What of the social life and group activities at N.U.? We have a wide range of clubs and organizations—one hundred and thirty to be exact. Whatever your interest may be, I am sure you will find a student organization which caters to it; if not, start your own.

Northeastern is similar to other universities in that you receive as much as you give; therefore, wherever you decide to attend school, become involved. Northeastern certainly gives you that chance.

**JoAnne Varnadoe**

## **The Faculty— Scholars, Innovators, Advisers**

Coming from almost every state in the nation and numerous foreign countries, our faculty members are chosen for their enthusiasm for teaching, their ability to stimulate intellectual and scientific curiosity, and their genuine understanding of young people.

Northeastern faculty re-examine and re-evaluate curriculum constantly to keep pace with the changing needs of students. As a result of this practice, many opportunities are available here which few other institutions can provide. As a student in the College of Liberal Arts you can, with the assistance of a counselor in the Dean's Office and a faculty adviser, plan your own program as part of an "Independent Major," thereby receiving preparation not provided by conventional concentrations. Information about application for the Independent Major may be found on page 109.

In the College of Engineering, assistance in selecting courses and choosing a major begins in the freshman year. Faculty advisers, each responsible for a small group of freshmen students, work under the direction of a master engineering adviser and the staff of the Dean of Students. Upperclass students are assigned faculty advisers from their major department. The College of Engineering curriculum, under constant review by the departments, is frequently revised to keep current with developments in the field. Recently, for example, computer science has been included as an option in the General Engineering Program, and computer engineering has been added to the Electrical Engineering Program.

The College of Business Administration offers a number of concentrations, plus an option for those who prefer a more general background in management. If you need academic counseling, the student personnel office of the College offers its services on an open-door basis. There is also a Student Advisory Committee which represents your interests and viewpoint and prepares student/teacher/course evaluations.

Cooperative work experience is particularly important for students in the College of Education. In a tight job market, graduates who have worked in schools, clinics, or other social agencies have a distinct advantage over those without such experiences. Students receive a solid liberal education in the course of qualifying for certification as elementary or secondary school teachers. The several emphases available to Elementary Education majors, for example, provide an opportunity for study in depth and serve as a basis for graduate specialization. The new Music Education major prepares graduates to serve at all grade levels.

The Colleges of Education, Criminal Justice, and Liberal Arts offer an undergraduate major in Human Services to students in these colleges who, in addition to meeting the requirements of their "home" college, take courses in each of the other two. In their junior and senior years, Human Services majors participate in supervised work experiences as preparation for entry into a wide and growing field. For details of the program, see page 166.



Northeastern's College of Nursing programs were the first in the country to be offered on a "co-op" basis. Through affiliation with twenty-one hospitals in the Greater Boston area, you are provided with a variety of clinical experience settings. The College strives to meet your needs by encouraging student representation on the majority of its standing committees.

As a Physical Education student, you may specialize at the elementary or secondary level or graduate as a generalist. You may now also elect concentrations in dance, science, coaching, athletic training, or other possibilities as second teaching areas. Many school systems are now adding drug education and sex education courses, and Northeastern's Health Education major can prepare you for these varied teaching experiences, as well as for the broad program in Health.

Physical Therapy offers the only program in the United States developed on the Cooperative Plan with alternating work-study experiences related to the curriculum, thus strengthening classroom and laboratory learning. In fact, all four departments in Boston-Bouv   College are offered on the five-year plan. Recreation students may elect one of three tracks as specialization — Therapeutic Recreation, Community Recreation, or Outdoor Education and Recreation.

When you are a pharmacy major, you may elect courses in clinical and hospital pharmacy, community pharmacy or areas which prepare for a research career in one of the pharmaceutical sciences. The program also includes the possibility of taking courses from other schools within the University.

Lincoln College's Bachelor of Engineering Technology (BET) program is distinctly different from typical engineering curricula. It prepares you for a unique and pivotal position on the professional-technologist-craftsman team. More than 100,000 technologists will be needed each year (schools now graduate only 25,000 per year) to work with engineers, scientists, doctors, supervisors, and artisans. The freshman year of the BET program contains course work which can also be used as excellent preparation for entering colleges of engineering.

The Cooperative Plan, and an emphasis upon applied rather than theoretical courses, contributes to the program in the College



of Criminal Justice. Graduates have found careers in law enforcement, industrial and retail security, criminalistics, corrections, rehabilitation and social services. Because of the academic nature of the program, many students have also undertaken graduate study in criminology, law, public affairs and social work.

Those of you in the Division of Allied Health Professions are prepared, through classroom study and authentic clinical experience during co-op, to assume a professional role in one of today's health fields. The programs in Medical Laboratory Science, including medical technology and cyto-technology, prepare you to assume laboratory duties at several levels in either co-op positions or part-time jobs while completing your baccalaureate degree program. Upon graduation, you are eligible for national registration examinations and also for graduate study. If you complete the Associate in Science degree in Respiratory Therapy, you may pursue a related baccalaureate degree program.

It has been said that "the most essential thing in the work of education is that sympathetic touch of life on life. It is by that fine process that personality is developed, matured, and enriched in all the younger candidates for human existence."

One reason for the success of the Cooperative Plan at Northeastern University is the "touch of life on life" which is made possible by the close association between more than 700 scholars on the faculty of the Basic Colleges and their students. When you enter Northeastern, you are assigned an academic adviser who works with you during your freshman year on a wide variety of problems concerning your personal and academic development. You are also given the opportunity for academic counseling throughout your upper-class years.

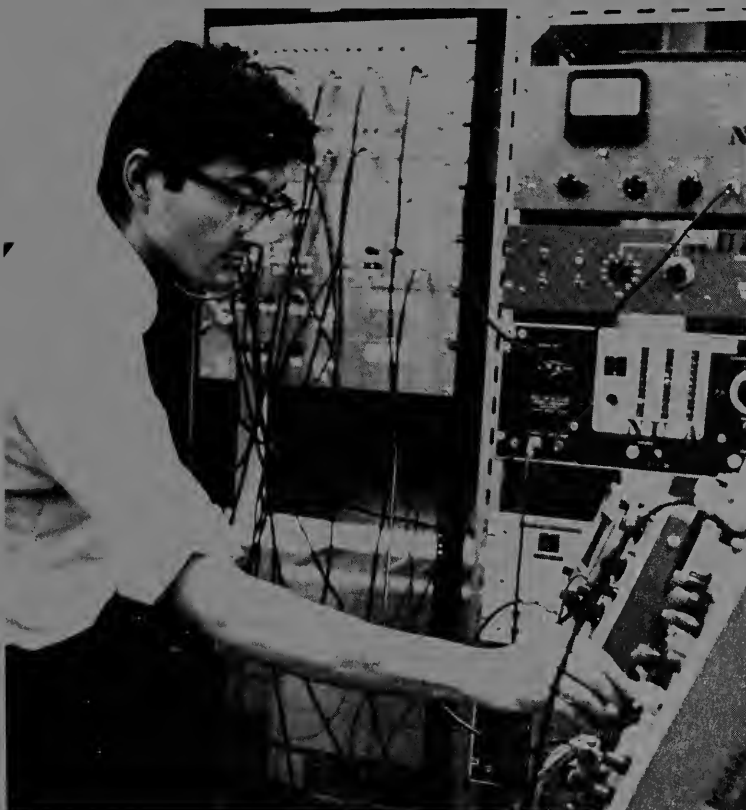
## Research

One of the fundamental purposes of a university is to discover new frontiers of human knowledge through basic research. This is of great importance in a university like Northeastern, which emphasizes preparation for graduate study.

Research projects totaling approximately \$6,000,000 yearly are being conducted in virtually all departments of all the Colleges, with support coming from the University, the Office of Education, the National Institutes of Health, the National Science Foundation, and many other government agencies and private industry. Nearly all programs employ either cooperative students or graduate fellows.

To show their diversity, a list of these projects would include fundamental studies in nuclear physics, mathematics, labor economics, solid-state theory, microelectronics, the effect of plasma on re-entry communications, cancer, biological applications of lasers, modification of visual threshold under hypnosis, and mathematical models describing metal alloys.

This research program helps Northeastern attract and retain the services of distinguished faculty members. You will be proud to know these men and women as professors in your classrooms.



## The Cooperative Plan

The Cooperative Plan brings relevance to your college education. By scheduling an alternating pattern between classwork and off-campus experiences, Northeastern helps you to develop personal maturity and realize your potential. The process itself—as you compare classroom theory with its realistic application—enlivens class work. Upon graduation, you will not only have a degree, but also a substantial amount of experience to offer a potential full-time employer. In addition, the money you earn on cooperative assignments will help to defray the cost of your tuition, books, and incidentals.

You will be assigned to a faculty coordinator who will be responsible for all phases of your cooperative program and will assist you in gaining maximum value from your education at Northeastern. Personal interviews, in which your academic progress and evaluations of your previous work experiences are reviewed, provide the basis for referral to specific opportunities that would help you realize your career objectives. Your coordinator is a specialist who keeps abreast of activities in specific areas of responsibility so that counseling on opportunities and trends in these areas can be provided. In general, starting assignments tend to be of a routine nature, to be followed by increasingly professional applications as your education and abilities increase. Subject to economic conditions and your willingness to consider alternative opportunities, you can expect to work on responsible and challenging assignments during participation in the program.

At some point in your program, you may wish to participate in an activity other than paid employment during a cooperative period. You may wish to travel abroad, spending time in one or several foreign countries learning about the customs, the culture, and the people. You may wish to volunteer your services to your local hospital or spend some time on an Indian reservation in the Southwest. Or you may wish to take specialized courses at another institution. Time to engage in these and similar activities can be arranged with your coordinator as a part of your cooperative education program.

Most cooperative curricula leading to the baccalaureate degree are five years in length. Programs consist of a freshman year of three consecutive quarters of full-time study followed by four upper-class years in which you will alternate periods of classroom attendance at Northeastern with periods on cooperative assignment. Some programs vary slightly from this pattern to meet professional requirements in their particular fields.

Associate degree programs in the College of Nursing and in Allied Health Professions require three years to complete, with two upper-class years "on co-op."

Participation in the Cooperative Plan is a requirement for all students in the Basic Colleges except those enrolled in the College of Liberal Arts. Liberal Arts students may elect a "full-time"

program in which eight quarters of upper-class study may be completed in three years. However, the majority of Liberal Arts students take advantage of the Cooperative Plan.

Further details on the cooperative program are available in a booklet entitled "Co-opportunities" which the Department of Admissions will be happy to send you on request.





## Alumni Association

More than 74,000 alumni of Northeastern are united under an all-University Alumni Association which has as its goals the promotion of the welfare of Northeastern University, the establishment of a mutually beneficial relationship between the University and its alumni, and the perpetuation of fellowship among members of the Association.

The Association is headquartered in the Office of Alumni Relations, Room 101 of the Carl S. Ell Student Center. The official records and addresses of alumni are maintained in the Office of Alumni Records, Room 260 of the United Realty Building.

The official publication of the Alumni Association, the *Northeastern Today-Alumni Edition*, published monthly except August and December, is sent to all alumni on record.

Activities of the Association, including the Homecoming celebration and the annual presentation of Professional Promise Awards to outstanding seniors in each of the Colleges, are directed by the Association through an extensive committee system. Alumni officers are also currently involved in establishing diverse continuing educational programs to meet the contemporary vocational and avocational needs of the Alumni Association.

Regional Alumni Clubs have been established from coast to coast. All alumni are eligible to become members of these organizations. The Alumni Clubs meet periodically with a varied program, often in conjunction with professional and athletic events, faculty visits, and service projects. Additionally, alumni class organizations conduct reunions for their respective classes every five years.

The Alumni Association has initiated a successful group travel program to provide the alumni of Northeastern with interesting, economical opportunities in foreign travel.

The Association sponsors and assists the various constituent organizations such as Sigma Epsilon Rho Honor Society, Varsity Club, Law, Pharmacy and Allied Health Sciences, Chemistry, Boston-Bouvé, MBA Association, and other special groups, all of which have their own officers and conduct various programs throughout the year. In cooperation with the Varsity Club, the Association presents trophies to the outstanding athlete of the year in each of the six major sports.

The Alumni Association provides a valuable service to the University and the community by sponsoring regional admissions conferences for high school students and the parents of those students who are interested in attending college. Alumni volunteers also serve the student body through programs of individual career counseling, welcoming international students and greeting students when they embark on a co-op assignment in an unfamiliar locale. In addition, alumni volunteers in many metropolitan areas across the nation represent the Admissions Office on a continuing basis at high schools and community colleges.



# PART II



# ACADEMIC PROGRAMS

## **ACADEMIC PROGRAMS**

### **Quarter-Hour Credits**

Northeastern University operates on a quarter system calendar. All courses are evaluated in terms of quarter-hour credit. A quarter-hour credit is equal to three-fourths of a semester hour credit.

**Classes at Northeastern University are scheduled in different modules.**

**In assessing quarter-hour weights for courses, the following statement applies.**

**One quarter-hour of credit is equal to 50 minutes of instruction per week, plus two hours of preparation.**

### **Tuition and Regulations**

Tuition rates, all fees, rules and regulations, courses and course content are subject to revision by the President and Board of Trustees at any time.

## **Boston-Bouvé College**

Paul M. Lepley, Ed.D., *Dean and Director of the  
Graduate School*

### **Professional Preparation**

After half a century of excellence as a college of physical education and physical therapy for women, Boston-Bouvé College merged with Northeastern University in July, 1964. From its very beginning in 1913, it stressed health education, recreation, winter sports, camping, and therapeutic exercise.

#### *Aims*

Today, Boston-Bouvé College of Northeastern University is coeducational with four undergraduate departments — Health Education, Physical Education, Physical Therapy, and Recreation Education. There are also two degrees at the graduate level, the Master of Science in Physical Education and the Master of Science in Recreation Education.

The primary goal of the College is to provide the very finest education for every student. To meet demands for fully qualified personnel in Health Education, Physical Education, Physical Therapy, and Recreation Education, the College seeks to develop the independent, self-reliant individual.

#### *A View of the Five-Year Program*

Professional preparation is based in the liberal arts and sciences, with orientation to each profession beginning in the freshman year. There is a concentration on specific essential skills spaced throughout the programs and on professional theory and practice in the last two years. In the junior or senior year, all students synthesize knowledge and skills through supervised experiences in clinical practice in Physical Therapy, student teaching in Physical Education, field experience in Recreation Education and student teaching or field experience in School and Community Health Education. Each curriculum is enriched by cooperative experiences which, for the most part, are related to a student's area of specialization. At times, co-op is professionally unrelated, but it is always concerned with people, thus providing an opportunity of inestimable value in any career.

### **Facilities**

The facilities of the College are quite diversified. Dockser Hall houses administrative and faculty offices, reading rooms, gymnasium, dance studio, physiology of exercise laboratory, classrooms, locker and shower facilities, as well as a community recreation laboratory, arts and crafts area, and seminar rooms. The swimming pool, weight room, handball courts, offices, shower and dressing facilities are located in the Barletta Natatorium complex. The Cabot building attached to Barletta contains one very large gymnasium, and another well-equipped for gymnastics, a rifle range, wrestling, boxing and weight machine rooms, an indoor athletic field, offices, and extensive locker space.



The Physical Therapy Department is located in Mary Gass Robinson Hall. On the third and fourth floors are the physical therapy faculty offices, a library, classrooms, and three laboratories. One of the laboratories is specially designed to simulate a modern physical therapy department and is well equipped for the practice of clinical procedures. In addition, there is the attractive Lupean Professional Library. This reading room maintains an up-to-date collection of physical therapy and medical books for use by students and faculty in the program and the College, and supplements the University's Library. These rooms are wired for closed circuit television to carry programs pertinent to the profession. This is also true of Dockser Hall.

The Warren Center serves as a practical laboratory for the College. Its athletic fields and tennis courts, natural setting of lake, woods, fields and streams, winterized cottages, and Hayden Lodge provide year-round opportunities for outdoor learning 25 miles from the Boston campus. Courses, conferences, seminars, and workshops are conducted at the Center throughout the year and thus serve University and community needs.

### **Admission**

See page 174 for statements concerning admission. Additional requirements basic to the admission of all prospective majors in the College include: good health, demonstrated ability to work with people, and the physical competence and skills to undertake the prescribed degree program. Full health clearance is required prior to matriculation at the University. In the third year, Physical Therapy students must be examined by either physicians in the University Health Services, at a moderate fee, or by a personal physician.

### **Graduation Requirements**

#### *Degrees*

Students graduating in Physical Education, Recreation Education, or Health Education earn the degree of Bachelor of Science in Education and students in Physical Therapy receive the degree of Bachelor of Science in Physical Therapy. These degrees are awarded to qualified candidates who have completed the curricula as prescribed. Student teaching, field experience or clinical practice is an integral part of the curriculum and is required for graduation.

### **Qualifications**

#### *Quantitative*

The quarter hours required in each curriculum differ.

	Q.H.
Health Education	172-175
Physical Education	172
Physical Therapy	169
Recreation Education	172

Students must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

Senior year course work and required experiences must be completed in full-time residence at Northeastern University, or in an educational setting approved by the college.

#### *Qualitative*

The overall cumulative quality point averages required to enter each class level are explicitly stated in the Student Handbook. Throughout the professional sequence, students must maintain required averages

and demonstrate a high level of personal and professional maturity to continue field practice and be approved for graduation. Because of accreditation recommendations and differences in curricula, qualitative requirement variations may occur.

Transfer students in any curriculum may be accepted in the College at upper-class levels if there are available spaces. Each transcript is individually assessed for qualification, placement and course design.

### **Graduation with Honor**

Candidates who have attained superior grades in their academic work will be graduated with honor. Upon special vote of the faculty, a limited number of this group may be graduated with high honor or highest honor. Students must have been in attendance at the University at least six quarters before they become eligible for honors at graduation.

### **Accreditation**

Physical Therapy is accredited by the American Medical Association and the American Physical Therapy Association. Physical Education and Health Education are accredited by the National Council for Accreditation of Teacher Education and the Interstate Certification Compact/National Association of State Directors of Teacher Education and Certification. Outdoor Education is accredited by the National Council for Accreditation of Teacher Education.

### **Focus on the Student**

There is a uniqueness about Boston-Bouvé. Perhaps it is the personal touch, a keen interest in every young man and woman, expressed in individualized advice and counsel. The College has its own professional clubs and Dance Theatre. Its social clubs and exciting assemblies contrast with quiet study rooms, seminars, and places for research. There is skiing in winter, camping in summer, sports year-round.

Students from every class are elected to the Student Advisory Board, the most influential body in the College, which elects as officers a moderator, a secretary, and an historian. It is the Board that conducts assemblies, organizes career days, and makes recommendations to the Dean on improvements in the College. It also promotes an annual book drive for selected institutions in the United States, as well as professional schools in foreign countries, and sends representatives to a variety of University organizations.

Community service is stressed in every department—service to the retarded, the physically handicapped, inner-city youth, and the aging. Students at Boston Bouvé College are students who are concerned with people.

## **SCHOOL AND COMMUNITY HEALTH EDUCATION DEPARTMENT**

Paul M. Lepley, Ed.D., *Professor and Chairman*

Helen M. Garrity, Ed.D., *Professor and Executive Officer*

### **FACULTY    Adjunct Professor**

Elizabeth A. Neilson, Ed.D.

### **Assistant Professors**

Sally J. Sparks, M.S.

Margaret M. Zaremba, M.S.W.

### **Instructor**

Sheila G. McNeil, M.Ed.

### **Lecturer**

Allen B. Fleming, M.Ed.

## **Professional Preparation**

### *Aims*

Health Education is a teaching profession. It is concerned with teaching not only in elementary and secondary schools, colleges and universities, but also in community and continuing education centers and a diversity of agencies and institutions.

### *Description of Major*

The program of study is an integration of liberal arts and sciences concentrated in the first two years, with professional courses emphasized in the last three. Health Education courses, however, begin in the freshman year.

### *A View of the Five-Year Major*

Cooperative education offers alternate periods of work and study which enrich and facilitate learning and, of course, assist the student in financing his/her education. In the senior year, every major synthesizes theory and practice in student teaching in the schools or in field experience in centers, agencies, and institutions.

The way of life that an individual chooses in health matters will affect all that he does and becomes. The health educator teaches people about health concepts and health maintenance—how to solve personal or family health problems, to use health services, to become involved in the health of the community—with the goal of increasing individual potential for a full and useful life.

## **College and University Services**

The Department of Health Education conducts the required health courses for professional students in Physical Therapy, Physical Education and Recreation Education in Boston-Bouvé College and in the College of Pharmacy and Allied Health Professions. Electives in health are offered to all University students.

A wide range of courses is offered in such areas as human sexuality, drug use and abuse, mental health, and nutrition. They may be taken as University electives.

## Special Requirements

All students in Health Education are required to have a full health examination prior to admission.

An appropriate activity uniform for Physical Education is required at a cost of approximately \$25.00

## Accreditation

Health Education is accredited by the National Council for Accreditation of Teacher Education and the Interstate Certification Compact/National Association of State Directors of Teacher Education and Certification.

## Sample Freshman-Year Program of Studies in School and Community Health Education

### First Quarter

General Chemistry  
English  
Social Science  
Foundations Health Education  
Boston-Bouvé Elective

### Third Quarter

Mathematics  
Biology  
English  
Health Problems of the School Child  
Physical Education

### Second Quarter

General Chemistry  
Biology  
Social Science  
First Aid  
Instructional Resources  
Introduction to Safety

*In addition to the above courses, a student may elect to take Basic ROTC.*

## Basic Course Requirements

### I. GENERAL (AND PROFESSIONALLY RELATED) REQUIREMENTS

Course	Q.H.	Course	Q.H.
*General Chemistry	6	*Social Science	8
*English	8	**Human Development	8
*Biology	8	Measurement and Evaluation	4
Microbiology	4	Introduction to Special Education	4
*Mathematics	4	Humanistic Foundations	4
**Psychology	8	Physical Education	2-5
Anthropology	4	General Studies electives	20
**Anatomy and Physiology	12		

*In accordance with NCATE recommendations on general studies, a student should take at least one course each in the symbolics of information, natural sciences, behavioral sciences, and the humanities (from among electives to fulfill requirements).*

### II. PROFESSIONAL REQUIREMENTS— TEACHING SPECIALTY

Course	Q.H.	Course	Q.H.
*Foundations of Health Education	2	Evolving Patterns of Community Health	4
Human Sexuality/Family Drug Use and Abuse	4	Organization and Administration of School and Community Health Education	4
Mental Health	4	*First Aid	2
**Nutrition	4	*Instructional Resources	2
Seminar in Health Education	4	*Health Problems, School Child	4
Health Counseling	4	Concepts in Health, Aging, and Longevity	4
Teaching Procedures/ Curriculum		Practicum in School Health	12
Health Education for School and Community	4	Practicum in Community Health	12
Communicable/Degenerative Diseases	4		
Introduction to Safety	2		

\* These courses are usually taken in the Freshman year.

\*\* These courses taken in the Sophomore year are professionally related, Anatomy and Physiology, for example. Health concentration begins in the third year.

## PHYSICAL EDUCATION DEPARTMENT

Carl S. Christensen, Ph.D., *Professor and Chairman*

### FACULTY Professors

John W. Fox, Ed.D.  
Kathryn Luttgens, Ph.D.  
Jeanne Rowlands, M.A.  
Richard C. Zobel, Ed.D.

### Associate Professors

Robert S. Curtin, Ed.D.  
Estelle M. Fotsch, Ph.D.  
William J. Gillespie, Ed.D.  
Kerkor Kassabian, Ed.M.  
Mary Nicholson, M.S.  
Harold A. Walker, A.B.

### Assistant Professors

Glenn A. Boden, M.Ed.  
Marilyn Cairns, M.S.  
Sandra Ann Hagen, M.F.A.  
Dorett M. Hope, M.S.  
Evelyn B. Howard, M.S.  
Marie Lintner, Ph.D.  
Hugh McCracken, Ph.D.  
Judith Noblitt, M.Ed.

### Instructors

Donna J. Cameron, M.S.  
Allan N. Sander, M.S.  
Diane E. Willcox, M.S.P.E.

### Professional Preparation

The Department of Physical Education conducts the undergraduate professional program for students majoring in Physical Education, electives for all University students, the intramural/club program for men and women, and Women's Intercollegiate Athletics.

### Aims

The professional program in Physical Education is designed to prepare specialists capable of developing the materials and methods appropriate to teaching physical education in public and private schools at all levels — elementary, secondary, and college. Its graduates are qualified as athletic coaches and/or trainers, physical education teachers, directors of athletics, supervisors of physical education, and leaders in YMCA and YWCA and other youth organizations.

### Description of Major

Students majoring in this program receive a strong background in general education and liberal arts. Elective hours are required in the areas of Science, Social Science, and Humanities. Courses in Physical Education include History, Philosophy, Principles, Curriculum Development and Class Procedures, Measurement and Evaluation, Kinesiology, Exercise Physiology, and Perceptual-Motor Development. Students are well grounded in the techniques of coaching the various individual, dual, and team sports, and in adapting these activities to the needs of the handicapped. Because of the close and overlapping relationship among the fields of Physical Education, Health, and Recreation, Physical Education majors may take courses in these areas.

Areas of emphasis include Athletic Training, Dance or the Foundation Sciences with concentration in the elementary school, secondary school, or generalist program. Class advisers are available to assist students as selections are made.



### *A View of the Five-Year Major*



The development and demonstration of personal skill in performance and teaching are an integral part of the professional program. Each student is expected to demonstrate a level of personal skill proficiency and knowledge competency in one activity for each of these areas: (I) Aquatics; (II) Dance; (III) Gymnastics; (IV) Racquet Sports; (V) Individual Activities; (VI) Fall and Winter Team Sports; (VII) Spring and Summer Team Sports. The degree of skill may be demonstrated through competency testing or by taking appropriate electives.\* Students will demonstrate, at the intermediate level, ability in one activity in six of the seven groupings; they must pass a beginning level course in one activity in one skill group. Major students are assigned supervised student teaching responsibilities in elementary and/or secondary schools throughout the Greater Boston area. In addition, students increase their experience with children through their cooperative work assignments and as counselors in summer camps.

Clothing appropriate for physical activity classes is required. Fees may be assessed in courses requiring highly specialized equipment, supplies, or off-campus facilities. In the spring quarter of the freshman year, there is a required one-week resident program at the Warren Center. An additional fee is charged for room and board.

*\* To qualify for beginning aquatics, dance, and gymnastics courses, Physical Education majors must demonstrate competence.*

### **Accreditation**

The professional program in Physical Education is accredited by the National Council for Accreditation for Teacher Education and the Interstate Certification Compact/National Association of State Directors of Teacher Education and Certification. Students who qualify may be certified by the National Athletic Trainers Association.

### **Electives in Physical Education**

A broad selection of electives in dance, sports, games, aquatics, and gymnastics is offered for all University students. All classes are open to men or to women with instructional modifications where appropriate.

Focus in the elective program is placed on the lifetime use of sports, dance, and aquatics for recreational satisfaction and participation. Classes are subject to cancellation if enrollments are too low.

### **Women's Intercollegiate Athletics**

The Women's Intercollegiate Athletic program has, as its prime purpose, the promotion of sports opportunities at the varsity and subvarsity levels for all undergraduate women students. Throughout the year, intercollegiate competition is available in basketball, field hockey, gymnastics, lacrosse, tennis, and volleyball.

### **Modern Dance Theatre and Jazz Dance Company**

The Northeastern University Modern Dance Theatre and Jazz Dance Company afford an opportunity to those students interested in dance as a performing art to choreograph and/or perform in concert. In addition to an annual concert production, these two groups present several lecture-demonstrations and/or concerts each year. Admission is by audition.

## Intramural and Extramural Sports

A comprehensive program of intramural and extramural sports is provided students through the media of clubs, leagues, and individual participation. Separate leagues are organized for commuters and dormitory and fraternity students. Intramural sports are organized for both men and women separately and on a coeducational basis in some activities. Throughout the year, intramural and club participation is possible in badminton, basketball, fencing, football, golf, gymnastics, modern and jazz dance, swimming, volleyball, and water polo. A "drop-in" program for individual leisure physical activity is also provided.

### Sample Freshman-Year Program of Studies in Physical Education

*First Quarter*  
English I  
Biology I  
Social Science I  
Human Movement  
Prof. Skills Electives

*Second Quarter*  
Math  
English II  
Biology II  
Social Science II  
Prof. Skills Electives

*Third Quarter*  
Health Problems of  
The College Student  
Physical Science  
Group Dyn. Practicum  
Child Observation  
First Aid  
Prof. Skills Electives

*In addition to the above courses, a student may elect to take Basic ROTC.*

## Basic Course Requirements

### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*English I & II	8	**Human Devel. I & II	8
*Biology I & II	8	**Ed. Measurement	4
*Social Science I & II	8	*Math	4
*Health Problems of the College Student	3	General Electives	32

### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Human Movement	4	Kinesiology	4
Physical Science	3	Measurement and Evaluation	4
Group Dynamic and Practicum	4	Historical Prip./Phil.	4
*Child Observation	2	Exercise Physiology	4
*First Aid	2	Outdoor Teaching Lab.	2
**Anatomy and Physiology I & II	8	Elementary School Activities	4
Adapted PE	4	Athletic Training	3
Anatomy and Physiology III	4	Administration of PE	4
Perceptual and Motor Learning	3	Curricula Development	3
Critical Teaching Skills	3	Student Teaching	12
8 Prof. Skill Electives	8	8 Prof. Skills Analysis/ Coaching	8
Boston Bouvé Electives	11		

*\*These courses are usually taken in the freshman year.*

*\*\*These courses are usually taken in the sophomore year.*

## PHYSICAL THERAPY DEPARTMENT

Elizabeth J. Fellows, M.A., *Professor and Chairwoman*

### FACULTY

#### Professor

Elizabeth W. Van Slyck, M.A.

#### Associate Professors

Pauline A. Cerasoli, M.S.

Ruth P. Hall, B.S.

#### Assistant Professors

Nancy Cardinali, M.S.

Janice L. Foster, M.S.

Betty G. Garman, M.P.H.

Cheryl L. Riegger, M.S.

#### Visiting Professor

Whitney R. Powers, Ph.D.

#### Instructors

Carole C. Burnett, M.Ed.

Theresa A. Cimini, B.S.

Maureen K. Holden, B.S.

Mary Slavin, B.S.

### Professional Preparation

#### *Aims*

The Department of Physical Therapy is dedicated to the preparation of therapists who can provide services of the highest quality in a time of changing concepts, new trends, and new challenges. Students will not only acquire the skill to help a patient gain functional independence, but learn to recognize and assist with emotional and socio-economic problems that affect recovery.

#### *Description of Major*

Physical Therapy is one of the health professions contributing to the delivery of comprehensive medical care. The physical therapist is highly skilled in evaluation procedures and in the planning and execution of treatment programs appropriate to the condition or disabilities of a patient. In addition, the responsibilities may include health care planning and community service. The qualified physical therapist administers physical therapy only upon referral by a physician.

Positions are available in general hospitals, children's hospitals, university hospitals, rehabilitation centers, schools or centers for crippled children, nursing homes, extended care facilities, and community, state, and governmental agencies. In addition, there are increasing opportunities in teaching and research in physical therapy.

#### *A View of the Five-Year Major*

The five-year program in Physical Therapy, based on the Cooperative Plan, is unique in physical therapy education.

The program of study is an integration of liberal arts and sciences and professional courses, with major emphasis on liberal arts in the first two years of the program and on professional preparation in the last three years. The professional courses include such subjects as Anatomy, Kinesiology, Pathology, Clinical Medicine, Neurology, Orthopedics, Physiology, Physical Therapy Procedures, Administration, and practical experience in various hospitals and clinics.



Lecturers from Tufts University School of Medicine and the New England Medical Center Hospitals, as well as from many medical and social agencies in the Boston area, augment the professional staff in the Physical Therapy program.

Supervised clinical education is a strong component of the curriculum and a requirement for graduation. Clinical experience provides the student with opportunities to practice various phases of physical therapy under supervision in preparation for assuming the role of a qualified physical therapist. Assignments in clinical education are not confined to the Boston area. They may include physical therapy departments throughout the country, particularly in many states along the eastern seaboard.

Students admitted to the Department of Physical Therapy must maintain acceptable standards of scholarship and performance in the prescribed program. They must also demonstrate adequate health, verbal fluency, essential motor skills, and emotional maturity; they must complete all required courses and have a favorable evaluation from clinical practice and co-op experience.

To continue in the program, students are required to attain and maintain a grade of C or better in professional courses. They must also demonstrate personal and professional maturity throughout the professional sequence to be recommended for graduation and placement. Students completing the prescribed curriculum are eligible to take state examinations for registration.

#### *Uniforms*

Women may wear the required gymnasium uniform for Physical Therapy laboratory classes beginning in the freshman year. Men wear navy blue shorts and white T-shirts for these classes.

Students are required to purchase uniforms and accessories prior to Supervised Clinical Education. The cost of clinic uniforms is approximately \$85.

#### *Clinical Education*

Students on clinical education assignments should plan on additional expenses, including travel.

#### **Accreditation**

The program is approved by the American Medical Association and the American Physical Therapy Association.

#### **Sample Freshman-Year Program of Studies in Physical Therapy**

##### *First Quarter*

Fundamentals of Mathematics  
Basic Animal Biology  
English  
First Aid

##### *Third Quarter*

General Chemistry  
Basic Animal Biology  
Foundations of Psychology I  
Health Education

##### *Second Quarter*

Fundamentals of Mathematics  
General Chemistry  
English  
Introduction to Physical Therapy

*In addition to the above courses, a student may elect to take Basic ROTC.*



## Basic Course Requirements

### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Fundamentals of Mathematics	8	**Basic Physics	9
*Basic Animal Biology	8	**Human Physiology	8
*English	8	**Human Anatomy	4
*General Chemistry	10	*Foundations of Psychology I	4
*Health Education	3	4 General Electives	16
First Aid	2	**Foundations of Psychology II	4

### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Introduction to Physical Therapy	2	Advanced Therapeutic Exercise	4
**Introduction to Physical Therapy	2	Neuroanatomy	3
**Perceptual and Motor Learning	3	Integration of Therapeutic Exercise	2
Gross Anatomy	6	Electrical Testing and Treatment Procedures	2
Physiology Related to Physical Therapy	3	Research Design	4
Massage	2	Psychosocial Aspects of Illness	3
Pathology	3	Rehabilitation	3
Clinical Medicine I, II, III	8	Supervised Clinical Education	5
Clinical Psychiatry	2	Clinical Seminar	3
Applied Anatomy	4	Administration	3
Basic Therapeutic Exercise	4	Investigative Studies	6
Evaluation Procedures	3		
Prosthetics/Orthotics and Functional Activities	4		
Management of Medical/Surgical Respiratory Disorders	2		

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

## RECREATION EDUCATION DEPARTMENT

Albert H. McCay, Ed.D., *Professor, Chairman and Director of the Warren Center*

### FACULTY

#### Associate Professors

Elaine Eliopoulos, M.S.  
Peter Graham, Ed.D.  
Richard B. Morrison, Ed.D.  
Frank Robinson, M.S.  
Alae-Eldin Sayed, Ed.D.

#### Instructor

George Atkinson, M.S.

#### Lecturer

Janet Swanson, M.S.

#### Assistant Professors

Sylvia Dawson, M.S.  
Robert C. Hayes, Ed.D.

### Professional Preparation

#### *Aims*

Recreation Education is a vital profession for a rapidly changing world. Prospects for the future clearly point toward an increase in leisure time and more income available for it. Public recognition of the need for trained administrators in this area, for people of all ages during all seasons of the year, has created new demands for career personnel.

#### *Description of Major*

Government agencies and educational institutions are expanding their programs. Recreation opportunities exist in community organizations, schools, business, and industry; in the Red Cross, Peace Corps, and Armed Forces; in camps, resorts, and parks; in departments of recreation in schools and colleges; in new recreation centers developed by youth groups; and in state, regional, and national parks.

#### *A View of the Five-Year Major*

The cooperative program of study is based in the liberal arts and sciences, with courses in professional education beginning in the freshman year.

The acquisition of knowledge and skills in arts and crafts, camping, dramatics, music, sports, dance, aquatics, hobbies, and therapeutic recreation for special groups is combined with training in leadership, organization, and administration.

Outdoor education, camp counseling, school camping, recreation, and park programming are essential aspects of the curriculum, and the Warren Center of Northeastern University offers an excellent and unique teaching-learning laboratory within easy commuting distance of Boston.

Supervised Field Experience, indoors and outdoors, provides both exciting and practical opportunities to work with children, youth, and adults. In addition, the Cooperative Plan offers seven quarters of practical, on-the-job experience in youth agencies, municipal recreation departments, hospitals and institutions, homes for the aging, and other selected settings.

Undergraduates in the Department of Recreation Education may select any one of three emphases: Community Recreation Education; Therapeutic Recreation for work with the retarded, the handicapped and the aging; or Outdoor Recreation/Education and Conservation.

### Special Requirements

Students are scheduled for their one-week resident camp experience at the end of the freshman year at the Warren Center in Ashland, approximately 25 miles west of the Boston Campus. The student cost for this experience is approximately \$90.00

During the winter quarter of the junior or senior year, a week is scheduled for ski and winter sports instruction as an elective. The student cost is approximately \$90.00-\$100.00.

There is no required uniform for Recreation Education students in activity courses.

### Accreditation

The Professional Program in Outdoor Education is accredited by the National Council for Accreditation of Teacher Education (NCATE).

### Sample Freshman-Year Program of Studies in Recreation Education

#### First Quarter

English  
Speech Fundamentals  
Social Science  
Orientation to Recreation  
Recreation Skills

#### Third Quarter

Basic Biology  
Health Education  
Social Science  
Recreation Skills

#### Second Quarter

Basic Biology  
English  
Social Science  
Recreation Skills

#### Third Quarter A

Outdoor Education and  
Camp Leadership

*In addition to the above courses a student may elect to take Basic ROTC.*

### Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
Biology	8	Earth Science electives	8
English	8	Workshop Drama	4
Social Science	12		
Speech Fundamentals	3		
Health Education	3		
Human Development	8		

#### II. PROFESSIONAL REQUIREMENTS AND PROFESSIONAL ELECTIVES

Course	Q.H.	Course	Q.H.
Recreation Budgeting and Finance	3	*Recreation Skills	19
*Supervised Field Work	16	*Orientation to Recreation	1
*Research and Readings	4	*Camp Leadership	4
Camp Administration	3	*Anatomy and Physiology	6
Recreation Activities for the Atypical	3	Outdoor Education	3
Philosophy of Recreation	3	Introduction to Therapeutic Recreation	3
*Senior Seminar	4	Educational Resources	3
Outdoor Education		Outdoor Education II	3
for the Handicapped	3	*Survey of Outdoor Facilities	3
School Camping	3	*Group Dynamics	3
Workshop in Adaptives	3	Methods and Materials	3
Community Schools	3	Administration of Recreation and Parks	4
Psychological Aspects of Disabilities	4	Int. to Community Recreation	4
Analysis of Movement as Applied to Recreation	4	Int. to Outdoor Education	3
<i>Others-See catalog listings</i>	—		

*\*Professional requirements*

## College of Business Administration

Geoffrey P.E. Clarkson, Ph.D., *Dean*

Philip T. Crotty, M.B.A., Ed.D., *Associate Dean*

John W. Jordan, M.S., *Associate Dean and Director, Graduate School  
of Business Administration*

Dennis Ramsier, *Assistant to the Dean*

### FACULTY ACCOUNTING GROUP

#### Professors

Carlo E. Gubellini, M.B.A.,

Faculty Coordinator

Joseph M. Golemme, M.A.,

C.P.A., Harold A. Mock

Professor of Accounting

Henry A. Kriebel, Ph.D., (Visiting)

Lawrence H. Malchman, Ed.M.,  
C.P.A.

#### Associate Professors

Joseph R. Curran, Ph.D.

Paul A. Janell, Ph.D.

Richard Lindhe, Ph.D.

James B. McNamara,  
Ph.D. Candidate

#### Assistant Professors

Marleen M. Izumi, Ph.D.

Sitikantha Mahapatra, Ph.D.

### FINANCE GROUP

#### Professors

Wesley W. Marple, Jr., D.B.A.,

Faculty Coordinator

Elliott L. Atamian, D.B.A.

Anghel N. Rugina, Ph.D.

Edward R. Willett, Ph.D.

#### Associate Professors

Lal. C. Chugh, Ph.D.

Robert J. Hehre, D.B.A., C.P.A.

Timothy Sullivan, Ph.D.

Jonathan B. Welch, Ph.D.

#### Assistant Professors

Michael A. Lenarcic,

Ph.D. Candidate

Paul M. Morris, Ph.D. Candidate

Donald M. Pattillo, Ph.D.

### GENERAL MANAGEMENT GROUP

#### Professors

Lyman A. Keith, M.B.A.

Russell W. Olive, D.B.A., P.E.

#### Associate Professors

Angelo J. Fiumara, J.D.

Victor B. Godin, D.B.A., P.E.

Robert C. Lieb, D.B.A.

Carl W. Nelson, Ph.D.

Robert A. Parsons, Ph.D. Candidate

Ashok Rao, Ph.D.

Daniel C. Scioletti, J.D.

#### Assistant Professors

Donald J. Agostino, Ph.D.

Steven E. Eriksen, Ph.D. Candidate

Stavros S. Frantzis, Ph.D.

John F. King, Ph.D. Candidate

Raymond M. Kinnunen, D.B.A.

Paul M. Morris, Ph.D. Candidate

Charles Shelley, Ph.D.

Frederick J. Stephenson, Ph.D.

Branch K. Sternal, Ph.D.

### HUMAN RESOURCES GROUP

#### Professors

Richard B. Higgins, Ph.D.

Faculty Coordinator

Daniel J. McCarthy, D.B.A.

#### Associate Professors

Christine L. Hobart, D.B.A.

Andre P. Priem, M.A.

Jeffry A. Timmons, D.B.A.

Edward G. Wertheim, Ph.D.

#### Assistant Professors

Matthew D. Arnett, Ph.D.

J. Lawrence French, Ph.D.

Herbert G. Graetz, D.B.A.



Timm L. Kainen, Ph.D. Candidate  
Francis C. Spital, Ph.D. Candidate  
Rudolph Winston, Jr., D.B.A.

**Associate Professor**  
Frederick Wiseman, Ph.D.

**MARKETING GROUP**

**Assistant Professors**  
Dan T. Dunn, Jr., D.B.A.  
Gerald Sussman, Ph.D. Candidate

**Professors**

Charles J. Collazzo, Jr., Ph.D.  
Philip R. McDonald, D.B.A.  
Robert J. Minichiello, D.B.A.  
Jehiel Zif, Ph.D., (Visiting)

## Professional Preparation



The College of Business Administration offers concentrations in the principal fields of business: Accounting, Entrepreneurship and New Venture Management (Small Business Management), Finance and Insurance, Human Resources, International Business, Management, Marketing, and Transportation. There is also a General Business concentration for those students who wish to select courses from several of the above subject areas.

These programs prepare men and women for positions of administrative responsibility in business, government, and other organizations. Their goal is to develop the ability to recognize and solve problems and to understand the scope of the business firm in community, national, and international relations.

In developing these skills, the student gains a broad understanding of business and organizational problems through specialized courses, as well as firsthand knowledge of effective solutions. From 40 to 60 percent of the course work in the College of Business Administration concentrations is centered in the arts and sciences to insure a liberal education.

All concentrations are offered on the five-year Cooperative Plan, providing students with substantial practical experience in the fields for which they are preparing.

### Aims

In keeping with the current trends in collegiate education, the educational aims of the College are:

1. To develop attitudes and ideals that are ethically sound and socially desirable;
2. To cultivate an appreciation of the social, political, and economic developments to which the business firm must adjust and adapt;
3. To develop the habits of accurate thinking that are essential to sound judgment and the habits of accurate expression that are essential to effective communication;
4. To provide an opportunity for the student to develop a specialization in business in accordance with his interests and talents.

### *A View of the Five-Year Program*

The upper-class program of study assimilates the practice of modern business management and administration with elective courses in liberal arts and other nonbusiness areas.

A concentration in Accounting will prepare students for professional public accounting, as well as for positions in private industry or governmental service. The concentration in Entrepreneurship and New Venture Management, Finance and Insurance, Human Resources, International Business, Management, Marketing, or Transportation, when combined with the experiences gained in both business and nonbusiness organizations on cooperative work assignments, will give students the experience and educational background for almost any type of administrative position for which their interests and abilities qualify them.

The business training and experiences during cooperative work periods will be most important factors in helping students determine the specific type of work and kind of organization with which they would like to be associated after graduation.

As a graduate of the College of Business Administration, you may see fit to continue your formal education on the graduate level. Such advanced study will extend your professional and research abilities so that you may better serve employers in business and industry. It will also prepare you for a career in college-level teaching.

If you plan to continue your formal education by enrolling in a law school after graduation, you will find that the undergraduate program in the College of Business Administration provides an excellent foundation. Many careers in law are directly involved in the business world, either in large corporations or in private practice. The College's curriculum provides you with a broad understanding of the business environment, as well as specific skills in the problems of operating a business in today's social and legal environment.

While the Association of American Law Schools does not recommend particular courses or curricula for prelegal students, it does advise that undergraduates build skills in comprehension and oral expression and develop critical understanding of the institutions and values with which the law deals.

The flexibility and liberal arts content of the College of Business Administration curriculum allows a student to fulfill these requirements and, at the same time, to acquire a specialized skill in and knowledge of the field of business management.

The College uses the problem and the case methods of instruction in addition to the lecture and recitation system. For the most part, in-



Introductory and basic tool courses are presented on a lecture-problem basis. A large portion of the classwork of the upper-class years consists of discussion, analysis, and reports on specific business problems and cases. Students are encouraged to analyze propositions, to challenge unsupported assertions, to think independently, and to support their thinking with logic and facts. Frequent verbal presentations and written reports are required. To facilitate the case method of instruction, there are special classrooms designed for the College.

### **Graduation Requirements**

Students may qualify for the degree of Bachelor of Science in Business Administration in one of the following areas of concentration: Accounting, Entrepreneurship and New Venture Management, Finance and Insurance, Human Resources, International Business, Management, Marketing, Transportation, or General Business.

Candidates for the Bachelor of Science degree must complete all of the prescribed work of the curriculum in which they seek to qualify. This presently totals 176 quarter hours of credit. The degree conferred not only represents the formal completion of the subjects in the selected courses of study, but also indicates professional competence in the designated area of concentration. An overall average grade of C is required for graduation.

A student must be enrolled in a full program of studies at Northeastern University during the final three quarters immediately preceding graduation.

### **Graduation with Honors**

Candidates who have achieved superior grades in their academic work will be graduated with honor. Upon special vote of the faculty, a limited number of this group may be graduated with high honor or with highest honor. Students must have been in attendance at the University at least six quarters before they can become eligible for honors at graduation.

### **Accreditation**

The Undergraduate Program of the College of Business Administration is fully accredited by the American Assembly of Collegiate Schools of Business.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas.

### **Sample Freshman-Year Program of Studies in the College of Business Administration**

<i>First Quarter</i>	<i>Third Quarter</i>
Introduction to Business	Accounting II
Math I	English II
Liberal Arts Elective	Liberal Arts Elective
Economics I	Economics II
<i>Second Quarter</i>	
Accounting I	
Math II	
English I	
Liberal Arts Elective	

*Students who will complete the Reserve Officer Training Course are permitted to drop one elective each quarter of their Senior year.*

*The College of Business Administration has no physical education requirement. Students wishing to take courses in physical education may take a maximum of eight (8) quarter hours as elective credits.*

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

Course	QH	Course	QH
*Math I & II	8	Introduction to Marketing	4
*English I & II	8	**Quantitative Methods I & II	8
*Introduction to Business	4	Organizational Behavior I & II	8
*Accounting I & II	8	Business and Society	4
*Economics MACRO	4	Business Policy	4
*Economics MICRO	4	Nonbusiness Electives	48
Introduction to Financial Activity	4		

*\*These courses are usually taken in the Freshman year.*

*\*\*This course is usually taken in the Sophomore year.*



## ACCOUNTING CONCENTRATION

### Professional Preparation

#### *Aims*

If you are anticipating a career in accounting, your interests probably lie within one of its two major areas: industrial accounting and public accounting. To provide you with the professional competence necessary to enter these fields, the College of Business Administration offers a variety of financial accounting and managerial accounting courses.

Preparation for a career in accounting encompasses a broad range of activities. These include all phases of record-keeping, internal and external reporting, financial planning, cost control, the design and installation of systems and procedures, the application of electronic and other modern business methods to these activities, and managerial decision-making.

Accounting is a fast-growing and critical area of business. It is an exacting field which requires men and women who enjoy dealing with facts and figures as well as with people. It requires accuracy and an ability to reason and to interpret business data.

*A View of the  
Five-Year Concentration*

During your first year, you will develop communicative and analytical abilities, gain an understanding of the nature of accounting, and survey business as a dynamic institution in an economic setting. Another important activity will be consultation with your coordinator from the Department of Cooperative Education about future work assignments.

Subjects in your third year will include courses in the various functional areas of business (marketing, finance, production, personnel), statistical analyses, and economic activity.

Whether your choice of employment is in the industrial accounting or public accounting area, you will study specialized courses in the third and subsequent years to equip you for your choice. Subjects will include Cost Accounting, Accounting Theory, Planning and Control, Auditing, and Taxes.

The sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. In addition to these common requirements, the following accounting core courses are required of students who concentrate in accounting:

Course	Q.H.
Accounting Principles III	4
Intermediate Accounting I & II	8
Cost Accounting	4
Accounting Theory and Practice or Accounting Planning and Control	4
Business Electives	8
Accounting Elective	4
Open Electives	32

## ENTREPRENEURSHIP AND NEW VENTURE MANAGEMENT CONCENTRATION

### Professional Preparation

#### *Aims*

The concentration in Entrepreneurship and New Venture Management (Small Business Management) provides students who plan to operate their own businesses with an opportunity to develop skills necessary for the effective management of small enterprises.

### *Description of Concentration*

Have you ever thought about starting, acquiring, and operating your own small business? Will you be faced with an opportunity to join a family business upon graduation? Have your views of or experience with large corporations made you think about life in a smaller organization? Or do you think you would get a real kick out of working for a small company and want to learn more about opportunities with smaller firms?

Are you considering a career in sales management, banking, public accounting, management consulting, or other areas which may involve you directly with owners and managers of new and small companies? For example, a bank loan officer, sales manager, or CPA would often have many entrepreneurs and small company officers as clients.

If your answer was yes to any of these questions, then you are probably a member of a unique and growing portion of Northeastern students and young people everywhere whose career definition of "doing your own thing" encompasses self-employment or work in a smaller company or other organization.

A concentration in this field will provide you with a thorough "start-to-finish" perspective. The concentration provides courses which deal with each of these key questions:

1. What are the characteristics of people who start their own companies, and what does it take to start and build a new business?
2. What are some key sources of business opportunities, and how does one assess feasibility of a particular venture?
3. What sources exist for raising seed capital, and how does one acquire it?
4. What are the critical problems and opportunities in managing successfully a smaller company, and what managerial methods are appropriate to deal with these?
5. What are the key issues in financing and managing an ongoing, growing venture, and how can these be applied to small ventures?



*A View of the  
Five-Year Concentration*

Courses in this concentration benefit students in several ways. They will develop the ability to assess personal aptitude and potential for small business, to find and evaluate business opportunities, to secure adequate funding, and to organize and manage the various facets of the small business—marketing, finance and control, and personnel.

Entrepreneurship and New Venture Management presents students with the opportunity to prepare for a career in which they can be involved in the management of business while maintaining a significant degree of autonomy and independence.

Some students will enter this career at graduation or sometimes even before it. However, many find that they first obtain experience through their cooperative work and postgraduate employment prior to establishing their own enterprises.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. See pages 51 and 52.

## II. PROFESSIONAL REQUIREMENTS

Course	Q.H.
New Venture Creation	4
Opportunity Analysis & Venture Capital	4
Small Business Finance	4
Small Business Management	4
Course	Q.H.
Business Electives	12
Open Electives	32

## FINANCE AND INSURANCE CONCENTRATION

### Professional Preparation

#### *Aims*

The objective of the Finance and Insurance Concentration is to train students for the financial management of businesses, nonprofit organizations, and governmental units. Preparation is two-fold: students receive *information* about current practices, theories, and concepts of financial management and gain *experience* in analyzing situations that require financial decisions.

#### *Description of Concentration*

Almost every phase of economic activity involves aspects of financial management—of cash or other funds, and of economic resources available to the individual, the business, or other economic unit.

Perhaps you can visualize your future career in one of the many areas of funds management: security analysis, estate planning, corporate finance and control, financial planning, security or insurance brokerage, underwriting, credit management, and banking. If so, you should consider the Finance and Insurance Concentration.

There are also career opportunities in specific financial institutions which perform indispensable services for present-day business and industry. Among them are banks, insurance companies, investment houses, credit concerns, financial service institutions, mortgage companies, and national and local real estate brokerage firms and appraisers.

Career possibilities exist in all areas of business, industry, and government, where financial planning and operation are vital.



*A View of the  
Five-Year Concentration*

As a middler, you study Introduction to Finance and beginning courses in other business fields. Specialization occurs in your upper-class years as you take advanced courses in insurance, investments, security markets, and basic business finance. To provide you with a well-rounded education, other courses are available, particularly in the broad area of economics.

Following the introductory course, your courses are Managerial Finance I and II, Investment Management, and Money and Economic Activity. In addition to these required courses, many electives are available. Examples of these electives are: Advanced Managerial Finance, Financial Analysis, Management of Financial Institutions, and Insurance. Independent Study is always an appropriate elective.

All courses which the Department of Finance and Insurance offers are open to students in any concentration who have taken the prerequisite subjects. Instructors may waive prerequisite courses in special circumstances. However, not all courses are offered every year because of staffing constraints.

A. MANAGERIAL FINANCE,  
subfield

There are two objectives of the finance function in the contemporary corporation or business entity:

1. To provide needed funds on terms that are the most favorable in view of current planning;
2. To regulate the flow of funds so as to maximize the realization of objectives.

The key concerns of financial management are the capital structure of the business and the optimal manner in which its assets should be held. With only minor differences, these same broad objectives apply to the finance function of nonprofit organizations, including those in the public sector (units of government).

B. MANAGEMENT OF  
FINANCIAL  
INSTITUTIONS, subfield

The area of specialization is broadly based within the subject area and is applicable to a variety of financial institutions and positions within them.

The three major topical considerations of the area of specialization are:

1. The institutional structure of the financial system and the relationship between it and the surplus and deficit units of the whole economy;
2. Asset, liability, and capital management problems of financial intermediaries;
3. Investment analysis and portfolio management policies appropriate to different financial intermediaries.

C. INVESTMENT AND  
MANAGEMENT  
ANALYSIS, subfield

There are two benefits of studying this concentration. First, the general understanding which students gain will help them manage



their own affairs. Second, it will assist those seeking professional careers in organizations where the investment function is paramount: industrial and utility corporations, real estate developments, financial institutions, and many governmental agencies.

The specialized skills and principles which students develop in the concentration should benefit them if they seek careers as investment managers or security analysts in the following organizations:

1. Stock exchanges, investment advisory firms, brokers-dealers, underwriters, mutual funds, and other investment companies which are a part of the securities markets;
2. Insurance companies, commercial banks, savings and loan associations, trust companies, mutual savings associations, pension funds, and organizations involved in the activities of the securities markets; or
3. Federal and state governmental agencies such as the SEC, FDIC, Treasury Department, IRS, and others having regulatory responsibilities regarding the securities markets and their participants.

#### **D. INSURANCE AND RISK MANAGEMENT, subfield**

The insurance concentration is divided principally between the insurance needs of individuals and businesses covering a wide variety of risks. The basic elements are designed to reduce existing risks and to establish frameworks within which future risks and uncertainties can be analyzed and managed.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. See pages 51, 52.

#### **II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
Financial Management I	4	Finance Electives	8
Financial Management II	4	Business Elective	4
Money and Economic Activity	4	Open Electives	32
Investment Management	4		

## **HUMAN RESOURCES MANAGEMENT CONCENTRATION**

### **Professional Preparation**

#### *Aims*

Human resources management, which focuses on the effective utilization of people at work, is an extension of personnel and labor relations but includes more than the traditional areas of recruitment, selection, compensation, and training. A human resources manager must also be knowledgeable about manpower planning, equal employment opportunity laws and affirmative action procedure, organizational development, career planning, job design and motivation, leadership, and communications. The ultimate goal is to provide an organization with the people who will be most effective in their jobs.

### *Description of Concentration*



In recent years there has been a growing interest in the quality of the employee's work life and the efficient production of goods and services. Companies such as Proctor and Gamble, AT&T, General Motors, and Burlington Mills, as well as a growing number of organizations in the public sector, are paying more and more attention to the quality of human performance at work and the level of human contributions to output. At a time when financial resources and investment capital are becoming scarcer, many organizations are beginning to take a closer look at the management of their people as their most precious resource. In recognition of the growing importance of this field and the increasing need for qualified people to staff it, Northeastern University's College of Business Administration offers an undergraduate concentration in Human Resources Management.

The effective management of human resources calls for a joint partnership between organizational specialists such as personnel administrators, labor relations negotiators, wage and salary analysts, and operating line managers in the various functional areas (marketing, finance, production) of the company. As the traditional role of personnel administration is expanded to include affirmative action programs, job enrichment, and organizational development activities, career opportunities in the fields of labor relations and personnel administration will continue to expand in both the public and private sectors.

For the student whose career aspirations lie in fields other than personnel and labor relations, one important point should be made: Human resources management is not a specialized activity confined to the personnel department. Whether you start your career as a work-flow analyst in manufacturing, a customer service assistant in marketing, as a field auditor in the accounting department, or a hospital unit manager, you will be required to demonstrate skills in working with individuals and groups to achieve desired results.

### *A View of the Five-Year Concentration*

Because human resources management is practiced not only by specialists in the area of personnel and labor relations, but also by line managers and specialists in many other business areas, we have structured the Human Resources Management Concentration to provide two alternative paths for the student:

#### **Human Resources Management Option #1**

Consists of courses focusing on the areas of personnel and labor relations:

##### *1. 3 required courses*

- People and Productivity
- Personnel Administration
- Contemporary Labor Issues

##### *2. 3 electives from the following:*

- Organization Structure & Process
- Managerial Skills Seminar
- Seminar in Collective Bargaining
- Reward Systems
- Labor Law
- Labor Economics
- Assessment of Prospective Employees
- Career Planning and Managerial Skill Assessment

**Human Resources Management Option #2**

Consists of a more generalized set of Human Resources Management courses appropriate to any prospective manager and/or specialist in any functional area of the business whose job will require interaction with other people to achieve desired results:

**1. 3 required courses**

People and Productivity  
Organization Structure and Process  
Managerial Skills Seminar

**2. 3 electives from the following:**

Personnel Administration  
Contemporary Labor Issues  
Interpersonal Effectiveness and Small Group Management  
Motivation and Control  
Strategies of Organizational Change  
Interpersonal Relations through Transactional Analysis  
Career Planning and Managerial Skill Assessment  
Dynamics and Practice of Superior/Subordinate Relations  
Assessment of Prospective Employees

The dual-option structure of the Human Resources Management Concentration is designed to achieve several purposes:

1. To provide students who choose to specialize in personnel and labor relations with a wider array of courses.
2. To provide students who wish to explore both the specialized and the more generalized aspects of human resources management with the opportunity to do so. In this case, students would be strongly encouraged to select courses from both Option #1 and Option #2.
3. To provide other concentrators (Marketing, Finance, etc.) with the opportunity to develop generalized expertise and skill in human resources management. In this case, Option #2 would be encouraged as a "second concentration."

**II. PROFESSIONAL REQUIREMENTS**

1. Human Resources Management (Option #1)	
Course	Q.H.
People and Productivity	4
Personnel Administration	4
Contemporary Labor Issues	4
Human Resources Management Electives	12
Business Elective	4
Open Electives	32

2. Human Resources Management (Option #2)	
Course	Q.H.
People and Productivity	4
Organization Structure and Process	4
Managerial Skills Seminar	4
Human Resources Management Electives	12
Business Electives	4
Open Electives	32

## **INTERNATIONAL BUSINESS CONCENTRATION**

### **Professional Preparation**

#### *Aims*

In recent years, several factors have contributed to a rapidly increasing need for qualified people in the field of international business. The growth of multinational firms, international trade, and regional international trading blocs has created a shortage of skilled managers who are equipped to analyze the complexities of international business problems.

The International Business Administration Concentration prepares students to meet these management needs. It develops an understanding of problems involved in operating business enterprises across national boundaries and an ability to analyze the operations of businesses in multinational environments.

The curriculum consists of the following:

1. A broad education provided by liberal arts course requirements.
2. A basic business education provided by business administration core requirements.
3. A specialized education in International Business.

#### *Description of Concentration*

The International Business Concentration consists of six courses. Two of them are required: Introduction to International Business and Seminar in International Business. There are also four electives: two from the International Business curriculum and two from the Liberal Arts Electives (See page 61.)

When you enroll in the International Business Concentration, you will find that its structure is most flexible, permitting you to have a dual concentration. For example, you may concentrate in International Business and use open electives to fulfill the requirement of a second concentration. The dual concentration is recommended, given that employment opportunities in the international business activities of an organization are in a traditional, functional area, as for example, production, marketing, or finance. All College of Business Administration courses which are offered as part of the International Business Administration Concentration are available to students in other concentrations during their middler, junior, and senior years.

#### *A View of the*

#### *Five-Year Concentration*

Careers in international business are available in most companies which carry on trade or manufacturing operations in foreign countries. An increasing number of multinational firms require that candidates for their top management positions have prior experience in international operations. In addition, large banks and insurance companies need managers who understand international business. Government, trade associations, and large unions also need people with international business skill, and the opportunity for foreign travel in any of these capacities is frequently available.

Students who choose this concentration gain an understanding of

the economic, political, and social constraints on international business. They also develop skills in analyzing the financial, marketing, and operational strategies of the multinational firm.

Liberal arts electives such as modern languages, political science, international economics, geography, and cultural anthropology—all appropriate to the understanding of international relations—are highly recommended to complement this concentration.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. See pages 51 and 52.

## II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
Introduction to		Business Electives	12
International Business	4	Open Electives	32
Seminar in International Business	4		
Business Administration			
Electives (International List)	8		
Liberal Arts Electives			
(International List)	8		

### **International Business Administration Electives**

#### *International Business Administration—College of Business Administration Electives*

International Accounting  
 Comparative International Management  
 International Financial Management  
 International Marketing  
 International Transportation and Distribution Management

#### *International Business Administration—Liberal Arts Electives*

Language and Culture  
 Individual and Culture  
 Evolution and Society  
 Culture in Transition  
 Economic Anthropology  
 Culture and Change  
 Social Change  
 Comparative Government  
 World Politics  
 International Relations  
 International Organization  
 International Law  
 Comparative Economics  
 Economic Development  
 International Economics

## MANAGEMENT CONCENTRATION

### Professional Preparation

#### *Aims*

Do your career interests lie in the broad area of administration rather than in specialized fields? The Management Concentration is designed to prepare you for a wide variety of administrative careers in business, government, and nonprofit institutions.

#### *Description of Concentration*

As a Management student you must have a basic understanding of all organization functions: accounting, marketing, finance, and production. However, your courses in these areas give you an overview of them, showing their interrelationships and the ways they can be used as management tools. For example, you study accounting as a help in the decision-making process, not as a specialty itself.

A similar approach is taken to courses in other areas. Since management is the process of getting things done through people, your professors pay significant attention to "people problems" to stress the importance of developing an effective work force.

The courses in the Management Concentration vary considerably in content and method of instruction because they vary in their objectives. In most of them, students are heavily involved in the conduct of classes and are required to work on group assignments. The purpose of this participatory approach is to prepare you for the demands of management in the business community.

#### *A View of the Five-Year Concentration*

The curriculum and teaching methods center around the development of basic skills and knowledge appropriate to administration, rather than upon specialized functional techniques. Although the case method of study is extensively used, a variety of teaching methods consistent with particular course objectives is employed. The basic objectives of the concentration are: to confront the student with appropriate learning experiences, to increase skills and knowledge in basic disciplines underlying administrative practice, and to develop judgment and skills in problem analysis and decision-making in organizations.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. See pages 51, 52.

### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
Cost Accounting for Management	4	Production Management	4
Management Information Systems	4	Business Electives	8
People & Productivity	4	Open Electives	32
Legal Aspects of Business	4		

## MARKETING CONCENTRATION

### Professional Preparation

#### *Aims*

A business organization not only designs and manufactures products, but also markets and sells them to manufacturers, wholesalers, retailers, and consumers. This is what a concentration in marketing is all about.

#### *Description of Concentration*

All the business activities that direct the flow of goods and services from producer to consumer are classified as marketing. The marketing process begins by determining the needs and wants of customers. Once these wants and needs are established, the organization's first objective is to produce a good or service to satisfy a particular consumer. Essential in all types of business are such activities as product design, research, pricing, packaging, transportation, advertising, selling, and servicing. The overall responsibility for these functions rests with the marketing manager.

The Marketing Concentration offers a wide variety of courses, taught by lecture and class discussion. They range from International Marketing and Consumer Behavior to Competitive Strategy and Marketing Research. Case materials are analyzed, and written reports are required.

#### *A View of the*

#### *Five-Year Concentration*



Outside the classroom, students may attend weekly meetings of the Advertising Club and of the American Marketing Association Student Chapter. Here they further their interests by discussing issues with leaders in the field.

Without successful marketing and advertising, industrial products remain unsold. More and more companies are finding that today's tempo of progress and high levels of production require up-to-date marketing techniques to generate a higher sales volume.

As a member of the management policy group, the marketing executive takes a broad view of all aspects of business management and policy. He also serves effectively as a trained specialist in his own area.

Success in the market is vital to every company, whatever its size. Therefore, the need for adaptable and informed marketing management exists in all types of business and industry.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the Concentration areas. See pages 51, 52.

### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
Marketing Management I & II	8	Business Elective	4
Marketing Research	4	Open Electives	32
Competitive Strategy	4		
Marketing Electives	8		

## **TRANSPORTATION AND PHYSICAL DISTRIBUTION MANAGEMENT CONCENTRATION**

### **Professional Preparation**

#### *Aims*

Transportation is an integral part of national and international distribution systems. It is a determining factor in the availability and prices of goods and services in our economy.

In corporate distribution, transportation specialists operate within a complex organizational framework in which goods are stored and moved. Effective management of this distribution process involves understanding of inventory control, warehousing, transportation options, and the interaction of these activities with other functional operations.

Growing concern with the economic and service conditions of the transportation industry has also created numerous job opportunities with government agencies which are engaged in transportation policy development and administration. Similar career opportunities may be found with carriers, such as airlines, railroads, and trucking companies which actively seek people who are familiar with the operational and regulatory aspects of their business.

The Transportation and Physical Distribution Management concentration seeks to prepare students for these diverse career opportunities.

#### *Description of Concentration*

The concentration attempts to provide the student with a balanced background in Transportation and Physical Distribution Management. Courses consider not only the viewpoint of the corporate shipper and carriers, but also those of public officials and consumer interests. Courses have a strong contemporary orientation and provide frequent interaction with practitioners from business and government.

#### *A View of the Five-Year Concentration*

Course offerings in Transportation and Physical Distribution Management are sequenced so that students who desire only an introductory exposure may take one or several courses as part of a broader business background. An undergraduate concentration in the area consists of six courses. Four are required courses with the balance of the concentration being composed of electives.



The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. See pages 51 and 52.

## II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
Principles of Transportation	4	Transportation Electives	8
Physical Distribution Management	4	Business Elective	4
Current Issues in Transportation Policy	4	Open Electives	32
Seminar in Transportation	4		



## GENERAL BUSINESS CONCENTRATION

### Professional Preparation

#### *Aims*

Because innovation and relevance are key words in the College of Business Administration, the General Business curriculum is adaptable to each student's needs. Meeting with a faculty advisor, you tailor your academic program to meet your own career goals.

### *Description of Concentration*

Students will be required to select a total of at least seven business electives beyond the Basic Course Requirements.

The Sample Freshman-Year Program of Studies and the General Requirements for the College of Business Administration are the same for all the concentration areas. See pages 51 and 52.

## II. PROFESSIONAL REQUIREMENTS

Course	Q.H.
Business Electives	28
Open Electives	32

## College of Criminal Justice

Norman Rosenblatt, Ph.D., *Dean*  
Robert D. Croatti, *Assistant Dean*  
Robert Fuller, *Assistant to the Dean*

### FACULTY

#### Professors

Frederick Cunliffe, Ph.D.  
Edith E. Flynn, Ph.D.  
Robert Gallati, LL.D.  
Joseph Senna, M.S.W., D.Jur.  
Robert Sheehan, M.A.

#### Associate Professors

Romine R. Deming, Ph.D.  
Larry Siegel, Ph.D.

#### Assistant Professors

James Reed, M.A.T.  
Frank Schubert, D.Jur.  
Wallace Sherwood, L.L.M.  
Donna Turek, M.A.  
Nicolas Hahn, Ph.D.  
James Fox, Ph.D.  
Spencer Rathus, Ph.D.

### Professional Preparation

#### *Aims*

Established in 1966 under a grant from the Ford Foundation, the College of Criminal Justice prepares young men and women for professional careers in Criminal Justice. The curriculum has been designed primarily for students interested in careers in the areas of criminal justice services. Law enforcement, corrections, and rehabilitation are some of the careers students can pursue. It is also expected that a number of graduates will choose advanced study in academic fields including criminology, forensic science, social work, public administration, and law, as well as in the entire area of Criminal Justice.

This College was founded to meet a significant social problem of our times. Innovative methods and ideas, as well as basic information, are needed by those involved in community and social services to cope with the growing problems of our society. As part of its educational role, the College has received substantial grants from the Department of Justice and has been designated as a center of education and innovation in the field of Criminal Justice and forensic science, as well as a Training Center in Criminal Justice.

#### *A View of the Five-Year Program*

The College of Criminal Justice offers a five-year academic program on the Cooperative Plan of education which allows a candidate for the baccalaureate degree to undertake a specialized program of study. It is anticipated that "co-op" assignments will include work in police departments, juvenile and adult correctional institutions, and probation, parole, and social agencies.

The student will receive a broad educational background for his or her future role in criminal justice. Course work in the social sciences, behavioral sciences, and the humanities will be integrated with professional courses since the student will be preparing himself or herself for a career involving the social problems of people from all walks of life. The liberal content of the curriculum is not only highly

desirable for its value as a foundation upon which general intellectual development may be based, but also as an indispensable educational requirement for professional service in the field of special interest.

Graduates must be prepared to judge objectively the many socio-economic problems inherent in the administration of justice in contemporary American society. The College of Criminal Justice will help prepare its students for a career which will not only be personally productive and rewarding but intellectually stimulating as well.

### **Graduation Requirements**

Candidates for the Bachelor of Science degree must complete all of the prescribed work of the curriculum, which totals 173 quarter-hours credit.

Students who undertake the Cooperative Education Program must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

No student transferring from another college or university is eligible to receive a degree until at least one year of academic work immediately preceding graduation has been completed at Northeastern.

### **Graduation with Honor**

Candidates who have achieved superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University for at least three years before they become eligible for honors at graduation.

### **Human Services**

A preprofessional program is offered for students interested in careers in Human Services. The Human Services major is designed to give the student a broad and comprehensive view of the needs of society and the variety of ways in which an individual may contribute toward meeting these needs. This interdisciplinary program involving the Colleges of Criminal Justice, Education and Liberal Arts aims to prepare students for entry into a wide variety of social service occupations. For details of the program and professional opportunities, see pages 166 and 167.

### **Sample Freshman-Year Program of Studies in the College of Criminal Justice**

#### *First Quarter*

English  
Economics  
Introduction to Sociology and  
Anthropology  
Hist. of Criminal Justice

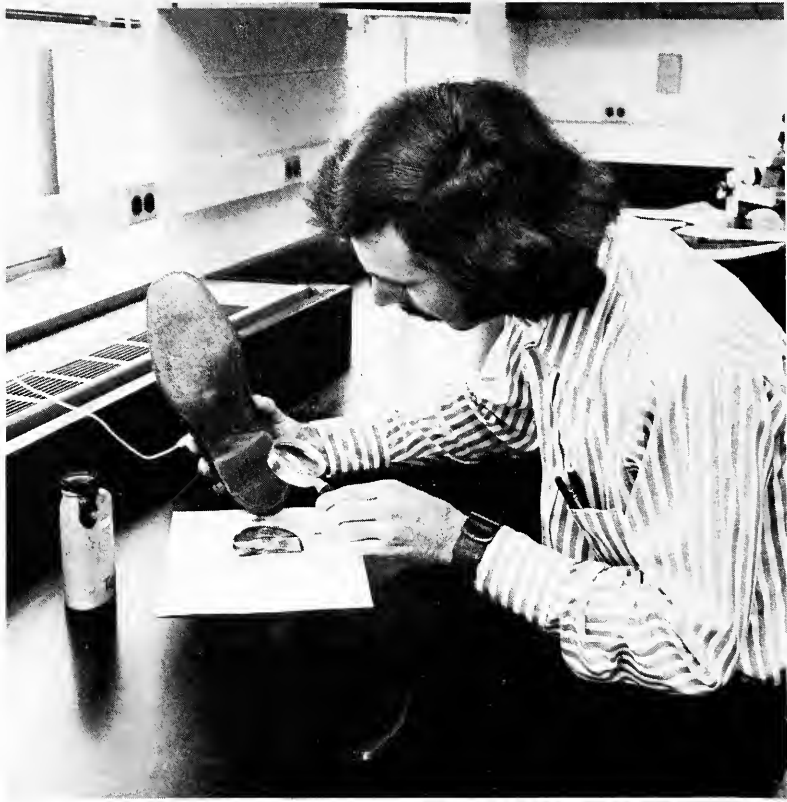
#### *Third Quarter*

Economics  
Found. of Psychology  
Introduction to American  
Government  
Adm. of Criminal Justice

#### *Second Quarter*

English  
Found. of Psychology  
Introduction to Politics  
Hist. of Criminal Justice

*In addition to the above courses, a student may elect to take Basic ROTC.*



## Basic Course Requirements

### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Principles and Problems of Economics	8	*Introduction to Literature	4
*Introduction to Politics	4	**State and Local Government	4
Introduction to American Government	4	**Functional Human Anatomy I & II or	8
*Foundations of Psychology I & II	8	**Physics I & II or	8
*Introduction to Sociology and Anthropology	4	**General Chemistry	8
*Freshman Writing	4	Professional Development	1
		Non-CJ Electives (14)	56

### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Administration of Criminal Justice	4	Constitutional Problems I: The Police and the Criminal Suspect	4
*Topics in History of Criminal Justice	8	Criminal Justice Electives (9)	36
Criminology	4	Statistics	4
Criminal Law	4	Research Methods	4

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

# College of Education

Frank E. Marsh, Jr., Ed.D., *Dean*

Charles. F. Haley, Ed.M., *Associate Dean*

Philip J. Rusche, E.D., *Associate Dean, Director of Graduate School*

Janice Walker, A.B., *Assistant Dean of Graduate School*

Allison S. Young, A.B., *Administrative Assistant*

## FACULTY

### \*EDUCATIONAL

#### ADMINISTRATION DEPARTMENT

##### **Professor**

Joseph E. Barbeau, Ed.D.

##### **Associate Professors**

Robert S. Butters, Ed.D.

Thomas F. Henstock, Ed.D.

Albert Kovner, Ed.D.

### \*COUNSELOR EDUCATION DEPARTMENT

Barbara A. Okun, Ph.D.

*Associate Professor and  
Chairperson*

##### **Professor**

Thomas F. Harrington, Ph.D.

##### **Associate Professors**

Irwin Doress, Ed.D.

William G. Quill, Ed.D.

Robert W. Read, Ed.D.

##### **Assistant Professors**

Wilbert J. McClure, Ph.D.

Katherine P. Newman, C.A.G.S.

Louis J. Rappaport, Ph.D.

James F. Scorzelli, Ph.D.

### CURRICULUM AND INSTRUCTION DEPARTMENT

Russell J. Call, Ed.D.

*Associate Professor and  
Chairperson*

### **Professors**

Melvin E. Howards, Ph.D.

Maurice Kaufman, Ph.D.

Paul H. Tedesco, Ph.D.

### **Associate Professors**

Nicholas J. Buffone, Ph.D.

Leslie A. Burg, Ed.D.

Mary J. Lee, Ed.M.

Robert C. McClean, Jr., Ed.D.

Harold A. Miner, Ed.D.

Sandra M. Parker, Ed.D.

### **Assistant Professors**

Thomas H. Clark, M.A.

Blanche Korngold, Ed.M.,  
C.A.S.

Carlton B. Lehmkuhl, Ph.D.

John F. Maguire, Ed.M.

### FOUNDATIONS OF EDUCATION DEPARTMENT

John D. Herzog, Ph.D.

*Professor and Chairperson*

### **Professors**

E. Lawrence Durham, M.A.

E. Vaughn Gulo, Ed.D.

Mervin D. Lynch, Ph.D.

### **Associate Professors**

Ronald E. Baptiste, Ed.D.

Wendell R. Brown, LL.B., D.S.

Cheryl C. Hanks, Ph.D.

Joseph Meier, Arbitur, Ed.D.

Irene A. Nichols, Ed.D.

Alvin D. Zallinger, M.A.

\* This Department offers graduate courses only. Consult the Graduate School Bulletin for course offerings.



#### **Assistant Professors**

Susan E. Rindler, Ph.D.  
Barbara A. Schram, Ed.D.

#### **REHABILITATION AND SPECIAL EDUCATION DEPARTMENT**

Matthew H. Luzzi, Ed.D.  
*Professor and  
Chairperson*

#### **Professor**

George J. Goldin, Ph.D.

#### **Assistant Professors**

Louise LaFontaine, Ed.D.  
James L. Lomastro, Ph.D.  
Susan E. Massenzio, Ph.D.  
JoAnne S. McKay, Ed.M.  
Deanna B. Spielberg, Ed.D.  
Dorothy A. Weber, Ed.M.

#### **SPEECH AND AUDIOLOGY DEPARTMENT**

Robert J. Ferullo, Ed.D.  
*Professor and Chairperson*

#### **Assistant Professors**

Arlene T. Greenstein, Ph.D.  
Martin Hanapole, M.A.  
Robert Redden, Ed.D.  
Kristine E. Strand, M.A.

#### **Instructors**

Leonard Israel, M.A.  
Kathy A. Murphy, M.A.

#### **SPEECH AND HEARING CLINIC**

Joseph C. Aurelia, M.A., Coordinator  
Gilbert G. Neil, M.S., Supervisor

### **Professional Preparation**

#### *Aims*

The College of Education at Northeastern offers professionally sound programs geared to the changing needs of today.

These programs have three major features:

- A. They are designed to make full use of the Cooperative Plan;
- B. They provide a broad, liberal academic base for professional study and experience;
- C. They emphasize the observational and clinical experiences to make theory relevant.

### **Elementary Education**

*Humanities, Social Science, Reading-Language, Mathematics-Science, Special Education, Early Childhood Education.*

A solid professional preparation in elementary programs makes Northeastern graduates highly respected in a competitive marketplace. In-depth study and experience in one area provides the base for advanced study in a variety of concentrations, including remedial reading, counseling, rehabilitation, special education, and administration.

### **Secondary Education**

Secondary majors are offered in social studies, English, foreign languages, earth science, general science, biology, chemistry, physics, and mathematics. The emphasis in these programs is on a sound curriculum that provides a base for effective teaching and permits the graduate to pursue advanced work in either the subject matter area or in education. Academically strong departments in the College of Liberal Arts provide the subject matter support for these programs. The College of Education faculty includes specialists in each of these areas to guide and direct the work of the students.

Students in the College of Education are expected to participate in the five-year cooperative program. Opportunities are steadily increasing for selected students to receive assignments in cooperating school systems, social agencies, hospitals, or libraries. In these settings, students enjoy unique experiences which greatly enhance self-confidence and professional growth.

### **Speech and Hearing Therapy**

The College of Education offers a Preprofessional Program in Speech and Hearing Therapy. This important professional area requires a master's degree for full certification. Students who complete the undergraduate program are prepared to enter graduate programs in Speech Therapy, Deaf Education, or Audiology.

### **Human Services**

A preprofessional program is offered for students interested in careers in Human Services. The Human Services major is designed to give the student a broad and comprehensive view of the needs of society and the variety of ways in which an individual may contribute toward meeting these needs. This interdisciplinary program involving the Colleges of Criminal Justice, Education and Liberal Arts aims to prepare students for entry into a wide variety of social service occupations. For details of the program and professional opportunities see pages 166 and 167.

### **Music Education**

Graduates of the Music Education major will be prepared to teach music to students from kindergarten to grade twelve. Competencies include: instrumental performance, (students are expected to develop a high level of performance on one instrument), the teaching of vocal music, conducting of musical groups, and a solid appreciation of music as a form of creative human experience. Cooperative work assignments in school settings are an integral part of the program.

### **Graduation Requirements *Degree***

The College of Education will award the Bachelor of Science in Education to those who successfully complete their program of preparation.

### **Quantitative Requirements**

The requirements will vary dependent upon the program pursued. Most students will need to accumulate 181 quarter-hours, with no program permitting fewer than 177. Specific program details may be obtained in the office of the Dean of the College of Education.

### **Qualitative Requirements**

Students in the College of Education are expected to maintain a minimum average of C. A minimum of C+ in the field of specialization and professional sequence is expected for recommendation for placement. Students are urged to rectify academic deficiencies at the earliest possible opportunity to prevent serious academic handicaps. The final three quarters preceding graduation must be completed in residence at Northeastern.

### **Graduation with Honor**

Candidates who have attained superior grades in their academic work will be graduated with honors, high honors, or highest honors. To

become eligible for honors at graduation, students must have attended Northeastern for at least six quarters.

### **National Teacher Examination**

Several states require NTE scores for certification, and a number of public school systems use NTE scores to evaluate applicants. Students are advised to obtain additional information from the office of the Dean of Education before deciding to write this examination.

### **Accreditation**

The programs offered by the College of Education are accredited by the National Council for Accreditation of Teacher Education. The College is a member of the American Association of Colleges for Teacher Education. Programs also are approved by the Interstate Certification Compact, assuring graduates of reciprocal certification in many states.

### **Sample Freshman-Year Program of Studies in the Teaching of Nonscience Fields**

ELEMENTARY EDUCATION/SPEECH AND HEARING  
THERAPY/ENGLISH/SOCIAL STUDIES/MODERN LANGUAGES

Mathematics or a modern language may be substituted for Political Science upon approval of the Dean during orientation week.

*Fall Quarter*  
Earth Science  
English  
Political Science  
Ed. Social Science

*Third Quarter*  
Western Civilization  
English  
Ed. Social Science Elective  
Elective

*Second Quarter*  
Earth Science  
Western Civilization  
Political Science  
Ed. Social Science Elective

*In addition to the above courses, a student may elect to take Basic ROTC.*

### **Sample Freshman-Year Program of Studies in the Teaching of Mathematics and Sciences at the Secondary Level**

GENERAL SCIENCE/EARTH SCIENCES/  
BIOLOGY/CHEMISTRY/PHYSICS/MATHEMATICS

*First Quarter*  
Basic Math or Calculus  
Chemistry or Physics  
Biology or English  
Ed. Social Science

*Third Quarter*  
Basic Math, Calculus, or Linear  
Algebra  
Chemistry or Physics  
English  
Ed. Social Science Elective

*Second Quarter*  
Basic Math or Calculus  
Chemistry or Physics  
Biology or English  
Ed. Social Science Elective

*In addition to the above courses, a student may elect to take Basic ROTC.*

### **Sample Freshman-Year Program of Studies in the Teaching of Music**

*First Quarter*  
Learning to Read and Write Music  
English  
Education and Social Science

*Second Quarter*  
Music Theory I  
English  
Keyboard I  
Elective

*Third Quarter*  
Music Theory II  
Keyboard II  
Two Electives

*In addition to the above courses, a student may elect to take Basic ROTC.*



**Basic Course Requirements.****A. Elementary Education:**

Students with a major in Elementary Education must follow an area emphasis selected from the curricular areas of the humanities, social sciences, mathematics and science, language/reading, special education, or early childhood education.\*\* The student is encouraged to consult his/her adviser for the specific courses and the order in which they are taken for both their area emphasis and professional requirements. The elementary majors' freshman program in education generally will apply in meeting the following general and professional curricular requirements.

**I. GENERAL REQUIREMENTS**

Courses Areas	Q.H.
A. Area Concentration	40
B. Humanities	16
1. Two literature electives (8 q.h.)	
2. One speech elective (4 q.h.)	
C. Social Sciences	16
1. Two history electives (8 q.h.)	
D. Mathematics and Science	16
**1. Two earth science courses (8 q.h.)	
2. Electives (8 q.h.)	
E. General Electives	16-32
4-8 depending upon area concentration	

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.
**Education and Social Science	4
**Education Social Science electives (2)	8
Human Development and Learning I	4
Educational Psychology elective	4
Education Humanistic Foundation elective	4
Fundamentals of Arithmetic I and II	8
Analysis of Teaching and Educational Process	4
Elementary Education Compendium I and II	8
Fundamentals of Reading I and II	12
*Remedial Reading	4
*Linguistics and Reading	4
*Children's Literature	4
Introduction to Special Education	4
*Introduction to Speech and Hearing Therapy	4
*Learning Disabilities	4
*Psychology of Mental Retardation	4
*Emotionally Disturbed elective	4
*Introduction to Rehabilitation	4
Student Teaching and Seminar	8
Professional Development	1
*Early Childhood Motor Skill Development	2
*Schools as Social Systems	4
*Creative Expression in Children	4
*Seminar in Early Childhood Development	4
*Language and Cognition	4
*Developmental Semantics and Syntax	4

**B. Speech and Hearing Therapy:**

Students in Speech and Hearing Therapy may expect a dynamic curriculum—a program that subscribes to guidelines and standards of the American Speech and Hearing Association. Thus, the following general and professional courses are required in this preprofessional program. The student should consult with his academic adviser for the specifics on courses and the order in which they are taken. The freshman program in education will apply in meeting the following requirements.

**I. GENERAL REQUIREMENTS**

Course Areas	Q.H.
A. Humanities	16
B. Social Sciences	20
1. Psychology of Abnormal Behavior (4 q.h.)	
2. Psychology of Personality (8 q.h.)	
3. Two history electives (8 q.h.)	
C. Mathematics and Science	16
D. General Electives	36

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.
**Education and Social Science	4
**Education and Social Science electives (2)	8
Human Development and Learning I	4
Educational Psychology elective	4
Education Humanistic Foundations elective	4
**Introduction to Speech and Hearing	4
Introduction to Special Education	4
Speech Science	4
Anatomy and Physiology of the Auditory Mechanism	4
Anatomy and Physiology of the Vocal Mechanism	4
Developmental Semantics and Syntax	4
Introduction to Educational Statistics	4
Developmental Phonology and Phonetics	4
Introduction to Audiology	4
Phonemic Disorders	4
Fluency Disorders	4
Fundamentals of Reading I	6
Diagnostic Techniques	4
Orientation to Clinical Practice	4
Clinical Practice	8
Professional Development	1

\*Area concentration electives

\*\*These courses are usually taken in the Freshman year.

**C. Secondary Education:**

The programs for teaching at the junior or senior high school level include the following subject area majors:

Biology  
Chemistry  
Earth Science  
English  
General Science  
Mathematics  
Modern Languages  
Physics  
Social Studies

Students are expected to complete the requirements for their major field of study in addition to courses taken in their freshman year. However, the student's freshman courses generally apply in meeting the other course areas of the following distribution and professional Requirements. The student should see his/her education academic adviser to obtain complete specification of the courses and their sequence for his/her general and professional course requirements.

**I. GENERAL REQUIREMENTS**

Course Areas	Q.H.
A. Major Subject area	40
B. Humanities	16
1. Two literature electives (8 q.h.)	
C. Social Sciences	16
1. Two history electives (8 q.h.)	
D. Mathematics and Sciences	16
E. General Electives	44-48
11-12 courses	

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.
**Education and Social Science	4
**Education Social Science electives (2)	8
Human Development and Learning II	4
Educational Psychology elective	4
Education Humanistic Foundation elective	4
Analysis of Teaching and the Educational Process	4
Measurement and Evaluation	4
†Writing and the Teaching of Writing	4
Methods and Materials of Teaching	4-8
#Teaching Reading in Secondary Schools	4
Student Teaching and Seminar	8
Professional Development	1

D. Human Services (see pages 163 and 164).

†For English majors only

#For English and Social Studies majors only

**E. Music Education**

Students who choose to major in Music Education are expected to achieve a high level of competence on one instrument. The major, offered jointly with the College of Liberal Arts, requires completion of 16 quarter hours in social sciences, humanities, and mathematics/science. (An audition is part of the admission procedure.)

**I. GENERAL REQUIREMENTS**

Course	Q.H.
History	8
Speech Elective	4
English	8
Literature	8
Education and Social Science	4
Human Development and Learning	8
Measurement and Evaluation	4
Education Humanistic Foundation elective	4
Education and Social Science electives (2)	8
Methods and Materials of Teaching	12
Analysis of Teaching and the Educational Process	4
Student Teaching Seminar	8
Professional Development	1

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.
Learning to Read and Write Music	4
Music Theory	12
Keyboard	8
Strings	8
Physics in Music	4
Music History or Music Literature Elective	4
Woodwinds	8
Organization of Instrumental Programs	4
Voice	4
Teaching Music in Elementary Schools	4
Brass	8
Teaching Music in Secondary Schools	8
Percussion	4

## College of Engineering

Melvin Mark, Sc.D., *Dean*

Thomas E. Hulbert, M.S., *Associate Dean*

Ralph S. Blanchard, M.S., *Assistant Dean*

George W. Hankinson, M.S., *Assistant Dean,  
Director of Graduate School*

David C. Blackman, B.S., *Assistant to the  
Dean, Director of Minority Affairs*

Bradford C. Perry, M.Ed., *Assistant to the  
Dean*

### Professional Preparation

The College of Engineering prepares students to participate constructively in a technologically changing world, thus contributing to the accumulation and application of new knowledge as professional engineers. Fundamentals are emphasized to provide the future engineer with the basic technical knowledge that will enable him to practice in a variety of positions. At the same time, study of the social sciences and humanities provides an opportunity to develop an awareness of the social, economic, political, aesthetic, and philosophical influences that are part of the context in which he will practice his profession.

#### Aims

The concept of education as a continuing, lifelong process necessary for effective work in an environment of constantly new facts, ideas, and scientific principles underlies the whole structure of the engineering curriculum.

Engineering education is directed toward assisting students to:

1. Understand the scientific principles and knowledge of that particular branch of engineering chosen;
2. Comprehend and develop competence in the engineering method and its application;
3. Communicate effectively and succinctly the important results of any technical study both verbally and graphically;
4. Acquire the motivation for continuing professional growth.

### Programs

#### Day Cooperative Programs

The College offers five-year cooperative programs in Civil, Mechanical, Electrical, Chemical, and Industrial Engineering leading to the degree of Bachelor of Science with specification according to the engineering department in which the student qualifies. The College also offers a General Engineering Program which leads to the awarding of an unspecified Bachelor of Science degree in which the student has the opportunity to design his curriculum with his career objectives in mind. The various curricula effectively prepare students to seek employment in industry or to continue their education in graduate schools. The College is operated on the Cooperative Plan.

Under the six programs, several options or specialized concentrations are available. They are:

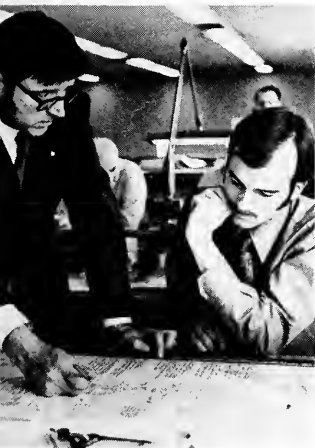
*Electrical Engineering—Power Systems Option.* To meet the needs of the rapidly expanding electric power industry, Northeastern has a special program in Power Systems Engineering. This program is

offered on the Cooperative Plan and can result in a bachelor's and master's degree in six years. The subject matter is basically that of electrical engineering augmented by work in power systems analysis, computers in power systems, nuclear plant considerations, power system planning, protection and stability, MHD and DC transmission.

*Civil Engineering—Environmental Option.* This option is designed for engineers intending to work in the field of environmental protection and improvement. Topics included at the undergraduate level are Water Supply, Treatment & Wastewater Disposal, Solid Waste Disposal, and Air Pollution. The cooperative program, resulting in a bachelor's degree in civil engineering in five years, enables one to go immediately into professional practice in government agencies, industry, or private consulting firms.

*Electrical Engineering—Computer Engineering Option.* This newly approved option has been developed to educate engineers to work in a variety of jobs in the computer industry or as preparation for graduate study. The option builds upon the basic electrical engineering curriculum by providing specialized courses in computer hardware and computer design. As with all programs, this option operates on the Cooperative Plan and leads to a Bachelor of Science in Electrical Engineering.

*General Engineering—Computer Science Option.* The major objective of this curriculum is to provide a balanced program of Computer Science, related technical subjects, and the Humanities. The student can draw upon the courses and facilities of many of the departments at Northeastern to fulfill his/her technical requirements. Combining this with the practical experience gained through Northeastern's Cooperative Education Plan, graduates of this program have an unequalled opportunity to enter the Computer Science field with an excellent education and up to two years of practical experience.



#### *Part-time Program Offered During Evening Hours*

The College of Engineering also offers an eight-year curriculum leading to the degree of Bachelor of Science in Electrical, Mechanical, or Civil Engineering. Classes are held in the evening. Admission and course requirements are the same as for the degree under the Cooperative Plan. For further information, consult the evening bulletin of the College of Engineering, or call the Dean of Engineering's office.

#### *General Description of Programs*

The undergraduate academic program begins with three quarters of full-time study. Course work during the first year builds the student's understanding of mathematics and the physical sciences and improves his ability to communicate ideas both verbally and graphically.

Since the first year of study is nearly identical for all students in the College, the choice of specialization may be changed at the end of the freshman year without loss. The freshman courses act as a foundation for upper-class studies which will develop basic understanding of concepts in the engineering sciences and introduce the student to the engineering method and its application. About four-fifths of the upper-class program is devoted to scientific and technological study, and about one-fifth to humanistic-social courses, with the aim of balancing the student's growing technical proficiency with a similar development of his appreciation of the nontechnical aspects of society and culture.

Cooperative work in the branch of engineering chosen will begin upon completion of the freshman year and continue throughout the remaining upper-class years. The work assignments during this time will prove to be most valuable in helping to integrate the important elements of both an engineering and a liberal education. They will be instrumental in teaching the value of teamwork while, at the same time, helping the student to acquire insight into the problems of actual engineering practice.

## **Graduation Requirements**

### *Degrees*

The College awards the Bachelor of Science degree in Chemical, Civil, Electrical, Industrial, and Mechanical Engineering, as well as the Bachelor of Science degree without specification.

### *Qualification for Degrees*

Candidates for the Bachelor of Science degree must complete all of the prescribed work of the curriculum in which they seek to qualify with no academic deficiencies. Students who undertake cooperative work assignments must meet the requirements of the Department of Cooperative Education before they become eligible for their degree.

No student transferring from another college or university is eligible to receive the Bachelor of Science degree until he has completed at least one academic year at Northeastern immediately preceding his graduation.

### **Graduation with Honor**

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University at least six quarters before they may become eligible for honors at graduation.

### **Accreditation**

All undergraduate day programs with specification and the College of Engineering's part-time evening program in Electrical Engineering are accredited by the Engineer's Council for Professional Development.

### **Women in Engineering**

Recognizing its opportunities, more women are entering the field of engineering every year. Aware of their qualifications and potential, industry and government provide positions of responsibility for competent women engineers. Any woman with scientific or technical interests should consider the many possibilities offered in engineering.

### **Minorities in Engineering**

Through its Progress in Minorities in Engineering (PRIME) program, the College seeks to expand educational opportunities for qualified Blacks, Hispanics, and American Indians who are citizens or have permanent resident status. It provides full scholarships based on merit and/or need. Every effort is made to provide enough aid so that outside work is not necessary during the freshman year. Guidance counseling and tutorial services are among the supportive services provided by the program.

The Sample Freshman-Year Program of Studies in the College of Engineering is the same for all majors in the College.

**Sample Freshman-Year Program of Studies in Engineering**

*First Quarter*

Basic Engineering  
Calculus  
Physics  
English

*Third Quarter*

Calculus  
Physics  
General Chemistry  
English

*Second Quarter*

Basic Engineering  
Calculus  
Physics  
General Chemistry

*The first-year pattern of two-term courses may vary according to assigned section.*

*In addition to the above courses, a student may elect to take Basic ROTC.*



## CHEMICAL ENGINEERING DEPARTMENT

Ralph A. Troupe, Ph.D., *Professor and Chairman*

### FACULTY

#### Professor

John A. Williams, Ph.D.

#### Instructor

Neil G. Sweerus, M.S.

#### Associate Professors

Ralph A. Buonopane, Ph.D.

Bernard M. Goodwin, Sc.D.

Richard R. Stewart, Ph.D.

### Professional Preparation

#### *Aims*

Since the field of chemical engineering is so varied, the program of study has been designed to provide students with a broad training in which fundamental principles are stressed. This training will enable them to acclimate themselves readily to graduate school or to whatever industry they may choose. The faculty stresses the principles of environmental control, conservation, and technology assessment to emphasize the importance of the engineer's role in society.

#### *Description of Major*

The chemical engineer has been defined as a "professional man experienced in the design, construction, and operation of plants in which materials undergo chemical and physical change." It is the task of the chemical engineer to reduce the costs, increase the production, and improve the quality of the products in the industry.

Chemical engineering has grown out of the discoveries in the chemical laboratories which have served as a foundation for a great many new industries whose production processes involve chemical as well as physical changes.

Petroleum refining, plastics, manufacture of synthetic fibers, and hundreds of other industries require men and women trained in chemistry as well as in engineering. Moreover, much of the training received by the chemical engineer is now being applied to the rapidly developing fields of nuclear engineering, space engineering, and environmental controls. Many older industries, such as foods, textiles, paints and varnishes, and leather are also employing chemical engineers, for the purpose of benefiting mankind rather than contributing to pollution or waste of resources.

#### *A View of the Five-Year Major*

After one has taken the fundamental courses in chemistry, mathematics, and physics required of all engineering students, he will go on to advanced courses which apply these fundamentals to the solution of engineering problems. These upper-class courses are a skillful blend of the latest mathematical and theoretical analyses with the practical aspects of the profession.

Chemical Engineering is one of the fastest growing major fields of engineering. Tremendous growth is occurring in research and devel-



opment, especially in such fields as petroleum and chemicals. (About one-third of all chemical engineers are employed in these fields.)

### Accreditation

The Department is accredited by the American Institute of Chemical Engineers as well as by ECPD.

### Laboratories

The chemical engineering laboratories are designed to acquaint the student with the experimental approach to the solution of engineering problems and to develop research interests. Research is conducted in the area of environmental control, energy conservation and transformation, technology assessment, photoreactions, process dynamics, control theory, computer applications, kinetics and design.

**Experimental Methods Laboratories**—The student is first taught the basic measurements in engineering with emphasis on temperatures, pressure, and flow rate. Following this, he is given problems in such areas as transport properties, kinetics, thermodynamics, and process dynamics, which he must solve experimentally. He is required to design the experiment, conduct it, reduce the data using computers, and write a final report. In the experiments, he uses pilot scale chemical engineering equipment when applicable.

**Research Laboratories**—These are used by advanced undergraduates and graduate students to carry out research in the various areas of chemical engineering. Analytical laboratories and shop facilities are available to support these research projects.

**The Nuclear Engineering Laboratory**—This laboratory contains a subcritical reactor purchased in part from funds supplied by the U.S. Atomic Energy Commission. The assembly is water-moderated and fueled with natural uranium.

The installation also includes a reactor simulator which has the same type of instrument panel and gives the same responses and reactions as any critical reactor in the country.

The Sample Freshman-Year Program of Studies in the College of Engineering is the same for all majors in the College. See page 79.



### Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*English	8	**Physics	4
*General Chemistry	8	**Physics Lab.	2
*Basic Engineering	8	Math	8
*Calculus	12	Economics	8
*Physics	12	Liberal Arts	
**Calculus	8	Electives (4)	16

#### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
**Organic Chemistry	8	Experimental Methods	8
**Polymer Technology	4	Chemical Engineering	
**Chemical Engineering		Thermo.	4
Calculations	8	Chemical Engineering	
Chemical Engineering	8	Kinetics	4
Physical Chemistry	8	Design or Research	
Transport Phenomena	8	Techniques Electives	12
		Technical Electives (4)	16

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

## CIVIL ENGINEERING DEPARTMENT

John J. Cochrane, Ph.D., *Associate Professor  
and Chairman*

### FACULTY Professors

Reginald L. Amory, Ph.D.  
Alcoa Foundation Professor  
of Civil Engineering  
Kenneth M. Leet, Sc.D.

### Associate Professors

Frederic C. Blanc, Ph.D.  
Leroy M. Cahoon, M.S.  
John J. Cochrane, Ph.D.  
Constantine J. Gregory, Ph.D.  
Robert L. Meserve, M.S.  
Saul Namyet, B.S.  
James C. O'Shaughnessy, Ph.D.

### Assistant Professors

Walter E. Jaworski, Sc.D.  
Antonis Koussis, Ph.D.  
Michael Kupferman, Ph.D.  
Richard J. Scranton, M.S.  
Gary Stewart, M.S.  
Irvine W. Wei, Ph.D.  
Gerald A. Woelfl, Ph.D.  
Mishac K. Yegian, Ph.D.

### Instructors

Mikhail Schiller, M.S.  
Robert Taylor, M.S.  
Alan E. Willis, M.S.

## Professional Preparation

### *Aims*

The Civil Engineering Department prepares its students for a professional career in one or several of the areas into which the field is traditionally divided: structures, water supply, wastewater disposal (environmental design), transportation, soil mechanics and foundations, and construction management. A major aim of the program is to provide a fundamental, flexible, and rigorous engineering education so that, in view of inevitable change within the field, the graduate will be in a position to build continuously on his basic knowledge and thus avoid any problem of technical obsolescence.

### *Description of Major*

Another major aim of the program is to provide the student with a broader vision—of the world, society, and the individual—than that of a one-sided technical program. A wide range of electives in the humanities, social sciences, and the basic sciences will encourage the student to investigate areas outside his immediate field and to extend his personal interests and involvements. In view of the growing problems of urban overpopulation, congestion, and pollution—and the increased social awareness of concerned individuals—the civil engineer no longer operates, as he did even in the recent past, with the requirements of a construction project or a client's interest solely in mind. Now the engineer must address himself to the larger considerations of the rights of all those affected by his urban planning decisions or proposed construction.

### *A View of the Five-Year Major*

The five-year work-study curriculum is divided into eleven quarters of school and eight quarters of work. The work phase often provides the



student with insight into the types of activity—drafting, surveying, design, construction—that the young engineer will normally confront. Thus the well-motivated student can determine from these work experiences what further course work preparation he will require to work successfully as a practicing engineer. The work stint also provides a certain amount of self-support and independence.

The first years of the in-school curriculum are, for the most part, devoted to the fundamentals of math, basic sciences, and engineering that provide the foundation for later professional studies. The final years are devoted to a range of professional subjects, both required and elected. Guidance from a faculty adviser is available throughout the academic program to work out optimal programs for each individual.

The curriculum is thus intended to prepare the young civil engineer to take up the design and construction of structures, to solve problems in the field of transportation, and to handle the design of water supply and waste disposal systems.

Upon completion of the requirements for the Bachelor of Science in Civil Engineering, the graduate is well prepared to enter the engineering profession or to go on to graduate school for advanced training. The young civil engineer will probably find that graduate work is a necessary adjunct for advancement.

During his first period of employment as a graduate, the young civil engineer may expect to spend a period in the field or the office. The work will probably involve some drafting along with design computations, layout work and supervision of construction, or the obtaining and analyzing of information for studies and reports. As experience is gained, the graduate will be entrusted with greater challenges and more responsibilities in design and in supervision.

Opportunities for employment exist at municipal, state, and federal levels, in private consulting practice, general construction, and industry.

### **Part-Time Program**

The Civil Engineering Program is also available on a part-time basis. The classes are scheduled during the evening hours, usually two evenings per week. The curriculum can be completed in a minimum of eight years.

Transfer programs for students with Associate Degrees or Bachelor's Degrees in Civil Engineering Technology can be arranged in either the day co-op or the part-time program.

### **Laboratories**

#### *Soils Laboratory*

The soils laboratory is well equipped to perform all standard soils tests as well as model studies.

A wide range of laboratory equipment permits the student to perform anything from nominal soil classification tests to sophisticated triaxial strength tests. The triaxial tests can be of strain-controlled loading, stress-controlled loading, or a combination thereof. Pore pressures measurements are made either electronically with pressure transducers or manually with null pressure indicators.

Consolidation test equipment of various load ranges and types is available. Consolidation tests applying loads up to 50 tsf on the sam-



ple are possible. In addition, the test may be conducted using back pressure technique to saturate the soil sampler.

Research can be conducted to study the seepage problems associated with earth dams, open braced cuts, etc. In addition, model studies on the bearing capacity of footings or piles are possible.

#### *Hydraulics Laboratory*

The laboratory is primarily for demonstration purposes. Equipment consists of a Flume with a varying gradient, water quantity measuring devices, such as Short Tube, Orifices, Weirs, Venturi Meter, and Reynolds Number. Research work can be conducted on many of the units.

#### *Water Pollution Control Laboratory*

Capabilities include analyses of both water and wastewater samples, in physical, chemical, and biological regimes. Laboratory and supporting equipment enable complete studies in the following areas: water analyses, wastewater analyses, stream and estuary studies, waste treatability studies, unit operations, bioassay techniques, pilot plant studies, tracer studies, and complete instrument analyses.

Instrument analyses capabilities include: atomic absorption, total carbon, organic carbon, specific ions, gas chromatography, spectrophotometric and gravimetric analyses.

Special areas are available for unit operation studies in water and wastewater treatment. A well-equipped machine shop has been established so that special equipment can be designed and built for model-prototype studies.

A new laboratory, the Gillette Environmental Research Laboratory, is fully equipped for research and development work in connection with the Ph.D. program in Environmental Engineering and Science.

#### *Air Pollution Laboratory*

Equipment is available to sample ambient air, gaseous and particulate pollutants, and for evaluation of the physical, chemical and biological characteristics of atmospheric pollutants. Continuous air samples may be established in any area in Metropolitan Boston and the samples analyzed by ultraviolet-visible, fluorescence, and atomic spectrophotometry, as well as gas chromatography and infrared techniques. A portable carbon monoxide analyzer with printout equipment is available for measurement studies and research work. Research in air pollution problems is a continuing project.

Recent equipment additions make it possible to conduct studies in noise pollution.

#### *Civil Engineering Testing Laboratory*

The testing laboratory is temperature-controlled and completely equipped to conduct all the usual tests on bituminous materials and mixtures, Portland cement and concrete. Equipment is also available for testing structural models.

The laboratory is suitably equipped to conduct research in the above materials, such as resistance to freezing and thawing, abrasion resistance, setting time, and strength.

Computer facilities for research studies in transportation are available.

The sample Freshman-Year Program for the College of Engineering is the same for all majors in the College. See page 79.

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

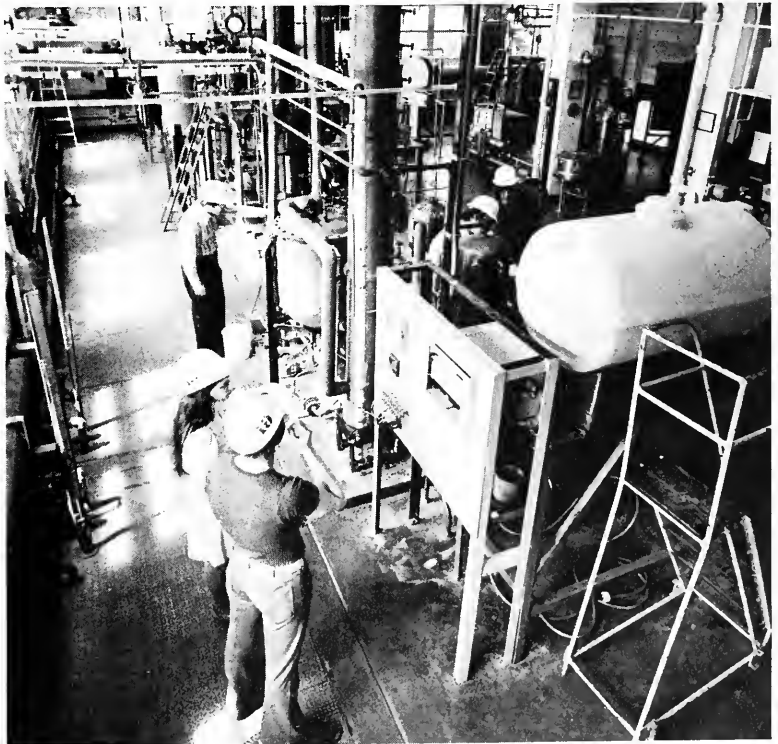
Course	Q.H.	Course	Q.H.
*English	8	**Physics	4
*Calculus	12	**Physics Lab.	2
*Basic Engineering	8	**Economics	8
*Physics	12	Math	8
*Chemistry	8	Public Speaking	2
**Calculus	8	Liberal Arts Electives (5)	20

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
**Thermodynamics	4	A. Professional	
**Engineering Measurements	6	Electives—7 required	
**Structural Mechanics	8	Civil Engineering Systems	4
Dynamics	4	Structural	
Materials	4	Analysis II, III	8
Fluid Mechanics	4	Structural Design II	4
Electrical Engineering	4	Concrete Design II	4
Soil Mechanics (w. Lab.)	6	Hydraulic Engineering	4
Environmental Engineering I	4	Engineering Geology	4
Concrete Design I	4	Foundation Engineering	4
Structural Design I	4	Transportation	
Structural Analysis I	4	Engineering	4
		Probability for	
		Civil Engineering	4
		Environmental	
		Engineering II, III	8
		Environmental Design	4
		Air Pollution	4
		Statistics	4
		Engineering Economy	4
		Construction Engineering	4
		Highway Engineering	4

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.



## **ELECTRICAL ENGINEERING DEPARTMENT**

J. Spencer Rochefort, M.S., *Professor and Chairman*

### **FACULTY Professors**

Sze-Hou Chang, Ph.D.  
Basil L. Cochrun, M.S.  
Ladislav Dolansky, Ph.D.  
James M. Feldman, Ph.D.  
Kenneth I. Golden, Ph.D.  
John G. Proakis, Ph.D.  
Harold R. Raemer, Ph.D.  
Wilfred J. Remillard, Ph.D.  
Martin Schetzen, Sc.D.  
Walter C. Schwab, Ph.D.  
Robert D. Stuart, Ph.D.

Arvin Gabel, Sc.D.  
Richard Grojean, M.S.  
Martin E. Kaliski, Ph.D.  
Wayne G. Kellner, Sc.D.  
Robert J. Lechner, Ph.D.  
Walter H. Lob, M.S.  
Morton Loewenthal, Ph.D.  
Robert N. Martin, M.S.  
Francis D. McCarthy, Ph.D.  
Louis J. Nardone, M.S.  
Sheldon S. Sandler, Ph.D.  
Mulukutla S. Sarma, Ph.D.  
Michael Silevitch, Ph.D.

### **Associate Professors**

Ralph E. Bach, Ph.D.  
Marcello J. Carrabes, M.S.  
Robert A. Gonsalves, Ph.D.

### **Assistant Professor**

John D. Glover, Ph.D.

## **Professional Preparation**

### *Aims*

Electrical engineers have been primarily responsible for the development of the computer, the pacemaker, television, satellite communication, space navigation, and the means of providing the energy needed to light our cities and towns and run our industries. At present, electrical engineers are also working to help find solutions to the problems of air pollution, transportation, and health care. These examples are just a small sample of the growing wealth of evidence which indicates that electrical engineering has impact on all facets of our society. As with all branches of technology, the societal functions and aims of electrical engineering are to maintain and improve the quality of life.

### *Description of Major*

Despite the diversity of its application, electrical engineering may be conveniently divided into the two broad, general areas of *information sciences* and *energy resources*. The area of information sciences is concerned primarily with systems whose function is computation, communication, or control. Included in this area are the circuits and devices which comprise the systems and the application of the systems and engineering techniques to other disciplines. Energy resources deal with the problems related to the sources, generation, and distribution of large quantities of electrical energy. It should be noted, however, that no rigid boundary exists between the two areas and many of the technical specialties within electrical engineering are applicable to both areas.

Many electrical engineers are involved with the more traditional activities of system design and development, such as the information

sciences or energy resources area. Other electrical engineers apply the knowledge gained in their professional education to such disciplines as ocean exploration, meteorology, experimental psychology, electronic music, health-care systems, bio-electronics, and educational devices for the disadvantaged.

The optimistic outlook for electrical engineering is based on the breadth of the technical activity described above. We are constantly reminded that among the pressing problems in our society are the "energy crisis," pollution, urban transportation, housing, health care, and the plight of the socially and physically disadvantaged. No one has yet been able to forecast how these problems will be solved without the use of technological resources. Readily available electrical energy, data processing, electronic instrumentation and control, and communication are among the crucial resources needed.

### *A View of the Five-Year Major*

The purpose of the curriculum is to provide the student with an education that has the breadth and depth necessary for professional practice. Breadth is needed to give the student an awareness of all that electrical engineering encompasses and to provide the necessary background for self-study, a major criterion for professional success. Individual career objectives and initial professional achievement can result in part from learning a subject area in some depth. To achieve the balance between depth and breadth, the curriculum is divided into the *core program* and *elective courses*.

The core program includes those courses whose content is applicable to all specialties in electrical engineering. In addition, it provides the student with exposure to all areas in E.E. and a basic background for future learning. Subject areas covered in the core program are:

1. Circuits and Systems
2. Electronic Devices and Circuits
3. Digital Computer Design
4. Electromagnetic Theory
5. Electromechanical Dynamics (Energy Conversion)
6. Electrical Measurements (Laboratories)

The elective courses are designed to permit the student to develop his/her own interests. Many students use this part of the program to learn a particular subject in depth and also to better prepare for graduate studies. A broad range of courses is offered and includes: Digital Computer Techniques, Numerical Methods, Communication Systems, Control Systems, Advanced Electronics, Solid-state Devices, Power Systems, Wave Propagation and Distributed Circuits, Network Theory, and Mathematical Techniques in E.E.

In addition, students who wish to do individual projects or learn about a subject area not offered in an elective course may enroll in the senior project course. The student in this course works with an interested faculty adviser on a one-to-one basis.

Electrical engineering graduates of Northeastern have attended and done well at all of the prestigious graduate schools. Those who have entered industry find they compare favorably with graduates of other institutions and many have risen to positions of leadership in their professions.



### Five-Year B.S.-M.S. Program

Students with high QPA's may elect the five-year B.S.-M.S. program. By taking some overloads and foregoing one senior co-op term, a student may complete requirements for both the B.S.E.E. and M.S.E.E. degrees within five years.

### Power Systems Engineering

The Power Systems Engineering Program in Electrical Engineering is a special option for those who wish to specialize in energy resources. This program is conducted in cooperation with the electric power companies in New England and other eastern states. The master's degree can be obtained in six years of cooperative education. For further information about this program, students are advised to contact Dean Phillip R. McCabe, Admissions, 150 Richards Hall.

### Computer Engineering

The option in Computer Engineering is provided for those who wish to specialize in that portion of electrical engineering relating to computers. Further information about this program may be obtained at the office of the E.E. Department, Room 411, Dana Building.

### Laboratories

The seven laboratory courses are an integral part of the educational process. Their purpose is to both supplement concepts developed in core courses and to introduce the student to design and experimental techniques.

To provide this facet of the educational experience, the department has laboratory equipment in excess of \$1.5 million. In addition to standard professional laboratory equipment, several specialized laboratory facilities are maintained. These include several small digital computers such as the PDP-8, an analog computer, a laser and optics laboratory, and a semiconductor devices laboratory, in which students fabricate transistors and integrated circuits.

The Sample Freshman-Year Program of Studies in the College of Engineering is the same for all majors in the College. See page 79.

### Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Calculus	12	**Calculus	8
*Physics	12	**Physics Lab.	2
*General Chemistry	8	**L.A. Electives (2)	8
*English	8	Math Analysis	8
*Basic Engineering	8	L.A. Electives	20
**Physics	8		

#### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
**Circuits and Systems I & II	8	Field Theory I & II	8
Circuits and Systems III & IV	8	Material Science	4
Discrete Systems	4	Design and Organization of Digital Computers	4
Thermodynamics	4	Electronics III	4
Mechanics	4	Electromechanical Dynamics	4
Electrical Engineering Lab.	8	Professional Development	0
Electronics I & II	8	Technical Electives (4)	16

*\*\*These courses are usually taken in the Freshman year.*

*\*These courses are usually taken in the Sophomore year.*



The Electrical Engineering Department offers a wide variety of technical electives. These enable students to coordinate elective choices to satisfy their personal objectives of breadth or depth. To aid in selection, the elective courses are grouped by discipline.

### Technical Electives

*Electronic Circuits and Systems*  
 Selected Topics in Electronics  
 Theory & Tech. of Semicond. Dev. I  
 Theory & Tech. of Semicond. Dev. II  
 Senior Project Labs  
 Control Systems  
 Communication Theory  
 Math Techniques in E.E. I & II  
 Numerical Methods & Computer Applications  
 Digital Techniques

*Electromagnetic Theory*  
 Wave Transmission & Reception  
 Advanced Topics in E & M  
 Math Techniques in E.E. I & II  
 Numerical Methods & Computer Applications  
 Theory & Tech. of Semicond. Devices I & II  
 Senior Project Labs.

*Computer Sciences*  
 Numerical Methods & Computer Applications  
 Digital Techniques  
 Fundamentals of Computation Structures  
 Introduction to Theory of Digital Computation  
 Communication Theory  
 Control Systems  
 Math Techniques in E.E. I & II  
 Selected Topics in Electronics  
 Senior Project Labs.

*Systems Theory*  
 Control Systems  
 Communication Theory  
 Math Techniques in E.E. I & II  
 Numerical Methods & Computer Applications  
 Digital Techniques  
 Power Systems I & II  
 Wave Transmission & Reception  
 Senior Project Labs.

**Power Systems Option Leading  
 to B.S. Degree-5 years  
 M.S. Degree-6 years**

### Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Calculus	12	**Calculus	8
*Physics	12	**Physics Lab.	2
*General Chemistry	8	**L.A. Electives (2)	8
*English	8	Math Analysis	8
*Basic Engineering	8	L.A. Electives (6)	24
**Physics	8		

#### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
**Circuits and Systems I & II	8	E.E. Power Lab.	4
Circuits and Systems III & IV	8	†Math. Methods in E.E.	4
Thermodynamics	8	Nuclear Engineering	4
Electrical Engineering Lab.	4	Technical Electives	4 or 8
Electronics I & II	8	Undergraduate Seminar	4
Field Theory I & II	8	†Linear Systems Anal.	4
Transients in Power Systems	4	†Anal. of Power Systems	4
†Probability	2	†Seminars (2)	4
Electromechanical Dyn.	4	†Power Systems Planning	4
Mechanics	4	†Special Topics in Power	2
Machines and Systems	8	†Grad. Electives	16
Electric Power Systems	8		
Professional Development	0		

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

†These are Graduate courses and are not needed for the B.S. degree.

**Computer Engineering Option  
Leading to B.S. Degree-5 years**

I. GENERAL REQUIREMENTS: Same as general E.E. except for deletion of one 4 Q.H. required math analysis course and one 4 Q.H. liberal arts elective.

II. PROFESSIONAL REQUIREMENTS: Same as general E.E. except for the deletion of one 4 Q.H. required E.E. course (Electromechanical Dynamics) and one 4 Q.H. technical elective and the following additional required courses:

Course	Q.H.	Course	Q.H.
Introduction to Digital Computers II	4	Machine Language and Assembly Language Programming	4
Programming Systems	4		



## GENERAL ENGINEERING PROGRAM

**ADVISORY COMMITTEE FOR  
1977 - 1978**

Thomas E. Hulbert, M.S., *Associate Dean of Engineering, Chairman*  
 Arvin Grabel, Sc.D., *Electrical Engineering*  
 Stewart Hoover, Ph.D., *Industrial Engineering*  
 Richard J. Murphy, Ph.D., *Mechanical Engineering*  
 Saul Namyet, B.S., *Civil Engineering*  
 Wilfred P. Rule, M.S., *Graphic Science*  
 Richard R. Stewart, Ph.D., *Chemical Engineering*

**Professional Preparation**  
*Aims*

Engineering and technology influence all areas of endeavor and have a profound effect on the lifestyle and institutions of the society. The impact is both cultural and scientific and is manifested by the awareness that solutions to society's problems are in part technological. The major purpose of the General Engineering Program is to provide flexible, interdisciplinary educational opportunities based on fundamental engineering concepts. The interdisciplinary nature allows the student to develop other areas of interest in which an engineering background is professionally useful.

*Description of Major*

The program is designed for students whose interests are in engineering-related professions rather than in the traditional profession of engineering. It is expected that the work engaged in by graduates of this program will encompass the entire spectrum of professional activity. Typical areas include computers, urban technology, social systems, and health care.

The General Engineering Program, including the computer science option, is highly elective and gives the student the opportunity to develop, in conjunction with his adviser, a program designed to meet his own career objectives. To achieve this goal, the student is exposed to the fundamental engineering areas of electric circuits, systems, mechanics, thermodynamics, and materials. These courses are based on basic principles developed in early courses in mathematics and physics.

As the computer is a basic tool in any technological environment, each student is required to learn the elements of computer programming.

Graduate education and continuing education are increasingly important in professional life. By appropriately planning his/her program, the student will be able to satisfy the course requirements necessary for admission into all types of graduate and professional schools, including law, medicine, public health, and social sciences, as well as engineering.

*A View of the  
Five-Year Major*

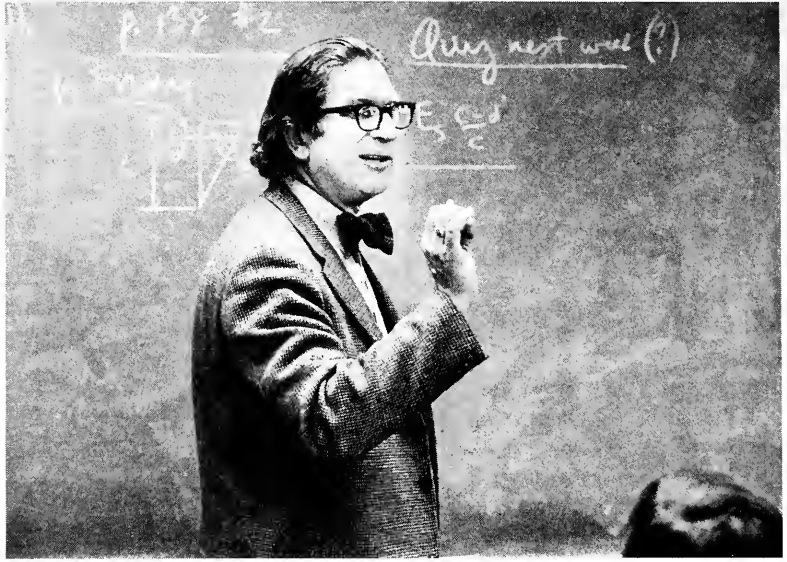
Each student in the program is required to satisfy the following minimum requirements beyond the freshman year:

- 8 quarter hours in Mathematics
- 6 quarter hours in Physics (including laboratory)
- 4 quarter hours in Circuit Theory
- 4 quarter hours in Materials
- 4 quarter hours in Systems
- 4 quarter hours in Thermodynamics
- 16 quarter hours in Social Sciences (consisting of at least two sequences of two courses each from the areas of sociology, economics, political science, and psychology)
- 8 quarter hours in the Humanities, consisting of at least two courses from the areas of art, history, language and literature (not including grammar), music, philosophy, and drama (not including public speaking)

The remaining portion of the program is completely elective but must be designed to fit the student's career objective. At least 24 quarter hours of course work must be taken in the professional departments in the College of Engineering (Chemical, Civil, Electrical, Industrial, and Mechanical Engineering).

Beyond the freshman year, the students plan their programs in conjunction with a faculty adviser. Basically, the elective program permits each student to plan a distinctive and highly individualistic curriculum. These indicate part of the range of curriculum planning available to the student.

While each student is enrolled in a "different program," the goals of each are the same: the breadth of an engineering-based liberal education in combination with the development of professional skills.



Students in the Computer Science Option are required to satisfy the following minimum requirements beyond the freshman year:

- 4 quarter hours in Computer Data Structures
- 4 quarter hours in Numerical Methods and Applications
- 4 quarter hours in Computer Architecture
- 4 quarter hours in Computer Languages
- A minimum of 28 quarter hours in Computer Sciences and applications in addition to those listed above.
- A minimum of 44 quarter hours in course work taken in the professional departments.

The mathematics, physics, humanities, and social science requirements are identical with those in the regular program.

## **INDUSTRIAL ENGINEERING DEPARTMENT**

David R. Freeman, Ph.D., *Professor and Chairman*

### **FACULTY**

#### **Professor**

Austin W. Fisher, Jr., Sc.D.

#### **Assistant Professor**

Ronald Perry, Ph.D.

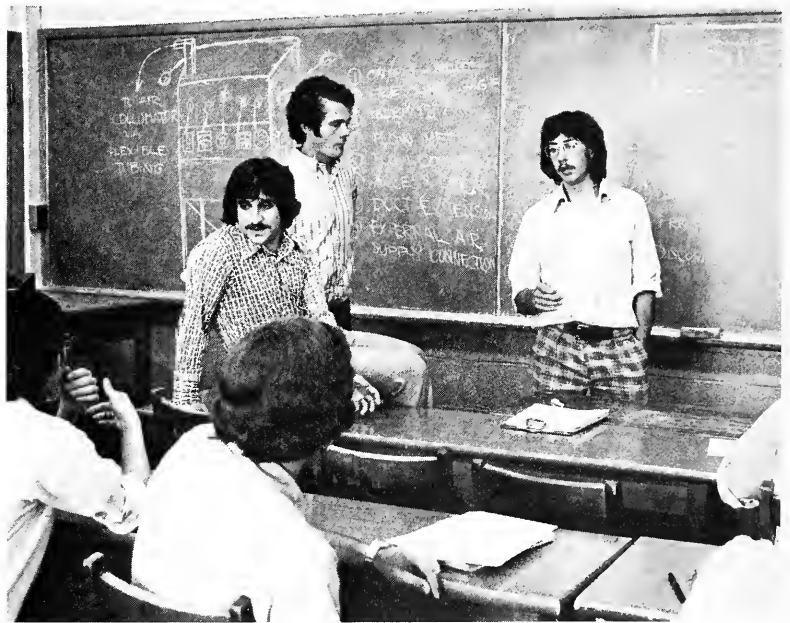
#### **Associate Professors**

Leonard P. Doyon, Ph.D.

Lewis H. Geyer, Ph.D.

Stewart V. Hoover, Ph.D.

Thomas E. Hulbert, M.S.



### **Professional Preparation**

#### *Aims*

Industrial engineers assist management in making decisions involving the utilization of men, materials, equipment, and energy to achieve the goals of an organization. Management needs factual information which defines the consequences of alternative decisions. The industrial engineer collects and analyzes this information and evaluates alternatives, thereby helping the manager to make the decision which best achieves a particular organizational goal. The scope of decisions may involve the entire organization, or some portion of it which is associated with a given product or service.

Traditionally, industrial engineers have been most widely employed in manufacturing organizations, but increasing numbers are now being utilized by service industries, such as the airlines, banks, hospitals, and local and federal government agencies. New courses recently introduced into the curriculum reflect the industrial engineer's interest in changing attitudes in society about computers, population growth, pollution, and the quality of life.

*Description of Major*

In performing problem analyses, the industrial engineer is concerned with complex, integrated man-machine systems. To treat the machine elements of the system, the industrial engineer requires knowledge of engineering fundamentals. In addition, he must have some background in the behavioral sciences to understand how the human elements of the system operate and how they relate to each other and the machines.

*A View of the  
Five-Year Major*

The extensive sequence in physics, mathematics, and engineering sciences in the program sharply differentiates an engineer's education from that of the student of business management.

The first two years will be devoted primarily to building a strong foundation through the study of mathematics, physics, English, chemistry, and the engineering sciences.

In the junior and senior years, more advanced subjects will be included. Among these are statistics, probability, operations research, quality control, computer science, management information systems, work design, personnel relations and plant layout.

**Five-Year B.S.-M.S. Program**

An accelerated program is available for honor students. It allows completion of the requirements for both B.S. and M.S. degrees in five years by overloads starting in the third year and the elimination of the senior co-op term.

**Special Information***Integrated Laboratory*

The new Industrial Engineering Laboratory is an integrated lab used for a variety of different courses. Directly associated with the lab classroom is the computer console room utilized in quite a variety of courses, the copying equipment for use in the plant layout courses, and the machine tool lab for use in work design and manufacturing courses. Students work as individuals or in groups, depending upon the scope and complexity of the project. Extensive laboratory project work is also conducted in outside industrial plants and service organizations on real problems. Students can view actual operations on occasional plant visits.

*The Computer*

Students are required to learn basic computer programming in their first year. In later years, they are asked to solve complex problems by computer. The University Computation Center provides a service to the student whereby he can leave his program at the Computation Center, have an expert run the program on a high-speed digital computer and, in a short time, pick up his results. The computer is of particular interest to the industrial engineer since many complex problems, such as assembly line balancing, mathematical modeling, and industrial simulations require a computer solution.

A human factors laboratory is used to perform experimentation in perception. The facility is used for demonstration and student projects.

The Sample Freshman-Year Program of Studies in the College of Engineering is the same for all majors in the College. See page 79.

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*Calculus	12	**Physics	4
*Physics	12	**Physics Lab.	2
*General Chemistry	8	**Economics I & II	8
*English	8	†Math Elective	4
*Basic Engineering	8	Public Speaking	3
**Calculus	8	L.A. Electives	20

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
**Work Design	4	Personnel and Organizations	4
††**Engineering Science Elective	4	Engineering Economy and Statistical Decision Theory	4
**Probability Analysis	4	††Engineering Science Electives (4)	16
Statistics I & II	8	†††Technical Electives (5)	20
Industrial Cost Control	4		
Operations Research	8		
Systems Analysis I & II	8		

*\*These courses are usually taken in the Freshman Year.*

*\*\*These courses are usually taken in the Sophomore year.*

*†Differential Equations or suitable offering of Math Department with consent of the adviser.*

*††Five Engineering Science courses are required. They must include:*

Prin. of Computation and Programming I  
Strength of Materials B  
Electrical Engineering I

*The remaining courses may be selected from:*

Prin. of Computation and Programming II  
Electrical Engineering II  
Mechanics II  
Flow of Fluids  
Thermodynamics I  
Materials Science

*†††Five Technical Electives are required. Three must be Industrial Engineering Electives:*

Production Planning  
Facilities Design  
Quality Control  
Management Information Systems  
Digital Simulation  
World Dynamics  
Manufacturing Processes  
Human Factors  
Industrial Relations  
Human Considerations in Design

## MECHANICAL ENGINEERING DEPARTMENT

Welville B. Nowak, Ph.D., *George A. Snell Professor of Engineering,  
Chairman*

### FACULTY Professors

John F. Dunn, Sc.D.  
Arthur R. Foster, M.Eng.  
Melvin Mark, Sc.D.  
John N. Rossettos, Ph.D.  
Joseph J. Zelinski, Ph.D.

### Associate Professors

Ralph S. Blanchard, M.S.  
H. Frederick Bowman, Ph.D.  
John W. Cipolla, Jr., Ph.D.  
Bertram S. Long, M.E.  
Ernest E. Mills, M.S.  
Richard J. Murphy, Ph.D.  
Warren G. Nelson, Sc.D.  
Thomas E. Phalen, Jr., M.S.  
Alvin J. Yorra, M.S.  
John Zotos, Met.E.

### Assistant Professor

T. A. Balasubramaniam, M.S.

### Instructors

Thomas Basso, M.S.  
Abdel-Hamid Hamdi, M.S.  
Steven A. Miller, M.S.  
Erwin Perl, M.S.

### Professional Preparation

#### *Aims*

Mechanical Engineering is the branch of the science which is broadly concerned with energy, including its transformation from one form to another, its transmission, and its utilization. Mechanical engineers conceive, plan, design, and direct the manufacture, distribution, and operation of a wide variety of devices, machines, and systems—including complex man-machine systems—for energy conversion, environmental control, materials processing, transportation, materials handling, and other purposes.

Mechanical engineers are engaged in all the engineering functions, including creative design, applied research, development, production, and management. The field of mechanical engineering is broad, providing an excellent professional base for career choice and interdisciplinary activities.

#### *Description of Major*

The curriculum is designed to accommodate changing demands on the mechanical engineer by establishing a firm foundation in the basic sciences before the student directs his studies toward a chosen area of interest.

#### *A View of the Five-Year Major*

In the first three years, the student learns the basic sciences (mathematics, physics, and chemistry), the engineering sciences (mechanics, thermodynamics, fluid mechanics, and material science), and the humanities. As an upperclassman, he can elect to concentrate his studies in the areas of thermofluid engineering, mechanics and design, or materials science and engineering.





Thermofluid engineering is concerned with the properties and characteristics of the working fluid of machines. For example, the ability of an aircraft to fly depends upon the manner in which air flows over its lifting surfaces. The energy to run a turbine is extracted from the steam or combustion gases which pass through it. The engineer must understand and have a knowledge of the concepts of thermodynamics. The efficiency of a cooling tower depends upon the mechanisms by which fluids transfer heat to surfaces so the engineer must have a firm grasp of the principles of heat transfer.

Mechanics and design are based upon the fundamental scientific and mathematical tools which are utilized in the analysis of mechanical configurations as they evolve in the design of machines and power-producing devices. For example, the engineer in the area of mechanics and design will analyze and design plate and shell components for nuclear power plants and deep-sea oceanographic vessels or develop new methods for evaluating filamentary composite structures. In the modern machine tool industry, he will be concerned with computer control of machine tools; in the engine industry, he will analyze stresses in such components as turbine blades. To prepare for this, the upper-class student will elect such courses as Experimental Stress Analysis, Advanced Strength of Materials and Deformation of Solids, Vibrations, Numerical and Computer Methods in Engineering Analysis.

Materials science and engineering is concerned with relationships among the structure, composition, properties, and functions of materials and with control of the structure and composition to achieve desired properties. Only recently have engineers come to realize that an understanding of the principles of materials science enables them to design more creatively and with greater freedom than the traditional reference to handbooks. Examples of areas where mechanical engineers find materials properties a part of the basic design function are: manufacturing techniques, structures (vehicles, buildings), energy conversion, electronic devices (including computers), packaging, and prosthetic devices. Advanced courses are available for those mechanical engineers who desire further knowledge in the materials field.

#### ***Five-Year B.S.—M.S. Program***

Honor Students may take an accelerated program. It allows completion of the requirements for both B.S. and M.S. degrees in five years by overloads starting at the third year and the elimination of the senior co-op term.

#### **Special Information**

##### ***Mechanical Engineering Laboratories***

The laboratories in Mechanical Engineering contain equipment ranging from an electron microscope and ultrasonic measuring devices to pumps and weirs. Students working on thermofluids projects may use a Rover turbine, a Wankel engine, diesel engines, thermoelectric coolers and generators, and a supersonic wind tunnel, to name a few. Material science has research microscopes, various furnaces, a fluid-to-fluid extrusion press, x-ray diffraction equipment, electron microscope, etc. For the mechanics and design areas, vibrations, experimental stress analysis and materials testing facilities are provided.

**Computers**

Twenty amplifier analog computers as well as time-sharing terminals give the laboratories both digital and analog capacity.

The Sample Freshman-Year Program of Studies in the College of Engineering is the same for all majors in the College. See page 79.

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*English	8	**Physics	4
*General Chemistry	8	**Physics Lab.	2
*Basic Engineering	8	**Liberal Arts Electives (2)	8
*Calculus	12	Math. Analysis	8
*Physics	12	Liberal Arts Elective	4
**Calculus	8		

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*Mechanics I & II	8	Measurement and	
**Thermodynamics I	4	Analysis	4
Thermodynamics II	4	Fluid Mechanics	4
Mechanics III & IV	8	Materials Science	5

**Junior and Senior Years**

There are twelve courses to be selected by Juniors and Seniors in addition to four Liberal Arts Electives. Nine of the 12 are subject to the following departmental restrictions:

**I. Required Mechanical Engineering Courses (5 required)**

- A. Mechanics
  - Dynamics (required)
- B. Thermodynamics
  - Heat Transfer (required)
- C. Materials (1 required)
  - Mechanical Behavior of Materials
  - Material Processing
- D. Design
  - Either M.E. Design (Design Fundamentals prerequisite)
  - or
  - Engineering Design

**II. Additional Mechanical Engineering Courses (4 required)****III. Electrical Engineering Course (1 required)**

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

## BIOMEDICAL ENGINEERING DEPARTMENT

Samuel Fine, M.D., *Professor and Chairman*

### Professional Preparation

#### *Aims*

Biomedical engineering is concerned with the scientific principles underlying the physical and biological sciences and their application to problems of biological and medical significance.

Biomedical engineers are engaged in both theoretical and experimental studies, either as independent investigators or as members of a research or development group. They characterize and determine the mechanism of action of natural and synthetic macromolecules, analyze the properties of blood, and investigate the structure and function of organ systems such as the nervous system, the respiratory system, the cardiovascular system and the endocrine system. They design, develop, market and apply transducers, cardiac pacemakers and defibrillators, heart assist systems, artificial kidneys and limbs, and diagnostic and therapeutic X-ray equipment. They are important members of the hospital health team.

There is no special curriculum in Biomedical Engineering. Several of the engineering disciplines in this catalog provide the engineer with a background in the physical sciences. The purpose of the Biomedical Engineering Department is to assist the engineering student from his freshman through his senior year in choosing courses in the biological sciences to complement those in the physical sciences and humanities taken in the standard engineering curriculum.

Courses will be chosen without prejudicing the student's obtaining a degree in his field of engineering specialization. In some cases, courses in the biological sciences can be taken as additional work during the student's career at the University. In other cases, courses in the biological sciences can be taken as electives in the standard engineering curriculum. The opportunity to take these courses is dependent on the student's interests, capabilities, and academic record. It is, of course, limited by possible schedule conflicts.

Students who wish to take an engineering program which includes biological sciences must contact the Biomedical Engineering Department on their arrival as freshmen at the University. This is important since biology is substituted in the first year for a portion of basic engineering.

Education in a program involving the physical and biological sciences provides a sound foundation for future studies toward a doctorate in medicine or dentistry, a career in biomedical engineering, or as an engineer in a hospital or governmental agency such as the Department of Health, Education and Welfare. Industrial organizations are seeking individuals with a strong background in engineering supplemented by a biological science education. Other career opportunities include public health, the psychological sciences, and the marine sciences.



## **GRAPHIC SCIENCE DEPARTMENT**

Wilfred P. Rule, M.S., *Professor and Chairman*

### **FACULTY**

#### **Associate Professors**

Franklyn K. Brown, M.Ed.  
Robert G. Finkenaur, M.S.  
Robert S. Lang, Ed.M.  
Kenneth S. Woodard, M.S.

#### **Assistant Professors**

James R. Maiellano, M.S.  
Robert Poe, Ph.D.

#### **Instructors**

Lawrence A. Bookman, M.S.  
Pamela Halpern, M.S.  
Nonna Lehmkuhl, M.Ed.

### **Professional Preparation**

#### *Aims*

The first responsibility of the Department of Graphic Science is to provide a comprehensive view of what engineering is all about. The student is confronted with several problems similar to those he will encounter during his professional career. Methods of problem solving and graphic representation of solution are emphasized so that the student will learn some of the ways engineers communicate through drawings and sketches. The role of an engineer as a creative designer is described by relatively large case studies that show the step-by-step solution to specially chosen problems that cut across several engineering disciplines.

The second major interest of the department lies in the area of computers. The department offers courses in FORTRAN, COBOL, SPSS, and other languages to the entire University community. Each of these courses is heavily involved in applications to show the diverse ways in which the power of the computer can be brought to bear on problems in such areas as engineering, social sciences, the humanities, and business.

Where possible, the students are instructed in the use of large discipline-oriented software packages that provide comprehensive and sophisticated problem algorithms but require a minimum amount of original programming to use.

# Lincoln College

William F. King, M.S., P.E., *Director, Associate Dean of Engineering*

Jacob Wiren, M.S., P.E., *Assistant Director*

Paul J. McInerney, B.A., *Assistant to the Director*

## **FACULTY Professor**

Israel Katz, M.S., *Engineering Technology*

## **Associate Professors**

Borah Kreimer, M.A., *Engineering Graphics*

Ernest E. Mills, M.S., P.E., *Mechanical Engineering Technology*

Louis J. Nardone, M.S., P.E., *Electrical Engineering Technology*

Thomas E. Phalen, M.S., P.E., *Mechanical Engineering Technology*

Kenneth S. Woodard, M.S., *Engineering Graphics*

## **Professional Preparation**

### *Aims*

Lincoln College offers programs in engineering technology. The courses of instruction prepare the graduate for activities closely allied to the field of engineering. Though they are concerned with the same general fields of engineering specialization, the programs concentrate on the applications of technology rather than its development.

Emphasis is placed on the rational processes in converting theories and ideas into practical techniques, procedures, and products, thus preparing students to enter the technological world as active participants whose mission is, simply stated, to get things done. The engineering technologist works with the professional engineer, scientist, medical doctor, supervisor, and craftsman in converting scientific knowledge and craftsmanship into products and techniques. Fundamentals are related to current practice, providing a supportive "why" for the practical "how." At the same time, study of the humanities and social sciences gives an opportunity for students to develop an awareness of the social, economic, and political influences that are part of the real world.

The structure of the Engineering Technology curriculum is based upon the dual need for relevant technical skills and the foundation for future growth. Engineering technology education can assist students to:

1. Understand the scientific principles that govern the current technology of the particular branch of engineering which they select;
2. Develop competence in the application of technology to problem-solving;
3. Communicate effectively the important implications of technological advancements;
4. Acquire the motivation for continued relevance in technical skills.

### *A View of the Five-Year Program*

Lincoln College offers five-year cooperative programs in Mechanical and Electrical Engineering Technology leading to the degree of Bachelor of Engineering Technology with specification according to the curriculum in which the student qualifies. The curricula effectively prepare students for employment in industry.

Since the first year of study is identical for all technology students, a firm choice of major may be delayed until spring. At this time, the choice of cooperative work assignments makes a decision mandatory. Freshman courses act as a foundation for upperclass studies which will develop a basic understanding of concepts in the technical application of the sciences. They will also introduce the student to the current technical hardware and its applications. About four-fifths of the upper-class program is devoted to scientific and technological study and about one-fifth to humanistic-social courses, with the aim of balancing technical proficiency with an appreciation for the non-technical aspects of society and culture. Cooperative work assignments during the upper-class years are most valuable in helping students to integrate the important elements of both a technical and a liberal education.

#### *Part-Time Program Offered During Evening Hours*

Lincoln College also offers seven-year curricula leading to the degree of Bachelor of Engineering Technology in the following areas:

- Civil Engineering Technology
- Mechanical Engineering Technology
- Mechanical-Structural Engineering Technology
- Electrical Engineering Technology
- Environmental Control Engineering Technology

Classes are held in the evenings and on Saturday mornings. For further information on admission to these programs, contact the Lincoln College office at 219 Hayden Hall.

#### **Graduation Requirements**

Candidates for the Bachelor of Engineering Technology degree must complete all of the prescribed work of the curriculum in which they seek to qualify. A total of approximately 180 quarter hours is required for the degree. Students who undertake the Cooperative Education Program must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

No student transferring from another college or university is eligible to receive the degree until he has completed at least one academic year at Northeastern immediately preceding his graduation.

#### **Graduation with Honor**

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University at least six quarters before they may become eligible for honors at graduation.

#### **Facilities**

The Northeastern electrical engineering laboratories are patterned after a composite of typical industrial research and development laboratories. Boasting a wide variety of modern testing and measuring equipment, the laboratories are an excellent adjunct to the classroom. Here the student may simulate or fabricate devices or systems which have been studied in his lecture courses.

From light machinery and power equipment to microwave precision systems, students plan and pursue their projects in the laboratory. Four PDP8I Digital Equipment Computers are available in the

laboratories for direct programming or use in other laboratory experimentation. In addition, several varieties of microprocessors and associated equipment are used in student laboratories.

The Mechanical Engineering Department includes the following laboratories:

*Materials and Metallurgy Laboratories*—Equipped to treat the physical examination of materials and their structures. The equipment includes modern apparatus for vacuum melting technology, X-ray diffraction, and thermal expansion studies, two research metallographs, an electron microscope, and fluid-to-fluid extrusion press.

*Fluid and Gas Dynamics Laboratory*—Designed to study aerodynamic and hydrodynamic phenomena such as vortices, separation streamlines, and shock waves. Equipment includes an aerodialog, an axial flow fan, shock tube, subsonic wind tunnel, and a supersonic wind tunnel.

*Materials Testing and Stress Analysis Laboratories*—Equipped to handle both the destructive and nondestructive testing of materials, this laboratory has a 300,000-lb. Universal testing machine provided with an automatic electronic stress-strain recorder and high-temperature tensile test furnace. Stresses and strains may be determined experimentally by the use of strain gage, photoelastic, photostress, and brittle lacquer techniques.

Recent additions include vibration-testing units, and a fatigue-testing machine of 2,000-lb. capacity, and vibration-testing units.

*Heat Engineering Laboratories*—Include a refrigeration unit which may also operate as a heat pump; two solid injection diesel engines provided with a continuous oxygen analyzer, one equipped with a strain gage torque meter; a CFR fuels research engine equipped with a strain gage pressure transducer; a 60-h.p. Rover gas turbine with automatic controls and Froude dynamometer; apparatus for study of steam-to-water heat transfer, comparison of film versus dropwise condensation, heat transfer to a boiling liquid, and thermocouple recovery factor; a thermoelectric generator to study the direct conversion of heat into electrical energy; a thermoelectric-refrigeration test facility for development of single and multistage thermoelectric coolers; and a Curtis steam turbine and condenser.

*Automatic Control Laboratory*—Includes a feedback control system and analog computers for simulation of engineering problems, and fluid power testing units.



### *Computation Center*

The Northeastern University Computation Center is a support arm to the many computer-oriented curricula of the various departments throughout the University. The facility has recently been updated with the installation of a powerful Control Data 6000 series system with time-sharing capability. As the prime computation center as required by the curricula, the Center is used by the students in both the Electrical Engineering Technology and Mechanical Engineering Technology programs.



### **Aviation Technology**

Kenneth S. Woodard, *M.S., Professor and Adviser*

Lincoln College also offers a full-time program in Aviation Technology leading to the Associate Degree. This program is based at the Burlington Campus and flying may be done at Wiggins Airways at Norwood or the Comerford Flight School located in Bedford. The Pilot School is approved by the Federal Aviation Administration. Students having a strong interest in flying as an integral part of their careers should contact the Director of the College.

### **Women in**

### **Engineering Technology**

Many women enter the technology field each year. Both government and industry provide positions of responsibility for women technologists. Any young woman with technical or scientific interests should consider engineering technology as a career.

The Sample Freshman-Year Program of Studies in Lincoln College is the same for all majors in the College.

### **Sample Freshman-Year Program of Studies In Engineering Technology**

#### *First Quarter*

Algebra and Trig. I  
Physics I  
English/Writing  
Engineering Design Graphics I  
Prin. Computer Programming I

#### *Second Quarter*

Algebra and Trig. II  
Physics II  
English/Literature  
Engineering Design Graphics II  
Prin. Computer Programming II  
Physics Lab. I

#### *Third Quarter*

Calculus I  
Physics III  
English/Literature  
Engineering Design Graphics III  
Prin. Computer Programming III  
Physics Lab. II

*In addition to the above courses, a student may elect to take Basic ROTC.*



## **ELECTRICAL ENGINEERING TECHNOLOGY**

Louis J. Nardone, M.S., *Coordinator for Electrical Engineering  
Technology*

### **Professional Preparation**

#### *Aims*

Since the Bachelor of Engineering Technology (BET) program has been designed to provide trained people for ready assimilation by the engineering field, its main thrust is not aimed at preparing the student for direct admission to the graduate schools of engineering.

However, the BET program can be an avenue of admission to the College of Engineering via several options for the student who achieves above average grades. Students who desire to explore this possibility should contact their freshman adviser or the Director of Lincoln College. In most other cases, graduates of the BET program will be eligible for graduate programs, such as business, law, and education.

#### *Description of Major*

Electrical engineering technology deals with the design and operation of equipment and systems related to power, communications, data processing, and electrical control. Its major functions are:

1. The generation, transmission, and distribution of electrical energy for light and power purposes;
2. The development and production of equipment for telephone, radio, television, radar, and communication;
3. The design and construction of data-processing systems and analog or digital computers;
4. The application of electrical and electronic devices in the control of processes and manufacture.

#### *A View of the Five-Year Major*

Since electrical engineering technology derives many of its fundamentals from developments in the pure sciences, the program of study begins with basic courses in mathematics and physics. In addition, the freshman year includes literature and engineering graphics to aid in developing the student's self-expression.

In the upper-class years, courses are divided into five related sequences: circuits and systems, including feedback control; electromagnetic field theory and microwave devices; energy conversion, emphasizing electromagnetic devices; and laboratory work associated with all of the foregoing. Current practice is stressed.

In the senior year, electives are offered to insure that students acquire depth and specialization.

The Sample Freshman-Year Program of Studies in Lincoln College is the same for all majors in the College. See page 104.

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*Algebra and Trigonometry I & II	8	*Principles of Computer Programming I, II, III	6
*Calculus I	4	*Physics I, II, III	12
**Calculus A & B	8	**Physics IV	4
*English	12	*Physics Lab. I & II	2
Principles of Economics	4	**Liberal Arts Electives	8
*Engineering Design Graphics I, II, III	6	Liberal Arts Electives	12
		Technical Electives	26

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
**Circuit Analysis I & II	8	Digital Computers	4
Circuit Analysis III & IV	8	Distributed Systems	4
**Physical Electronics	4	**Circuits Lab. I	2
Electronics I, II, III	12	Circuits Lab. II	2
Control Engineering I & II	8	Electronics Lab.	2
Engineering Analysis I & II	8	Advanced Electronics Lab. I, II, III	6
Energy Conversion	4		
Electrical Measurements	4		

*\*These courses are usually taken in the Freshman year.*

*\*\*These courses are usually taken in the Sophomore year.*

**MECHANICAL  
ENGINEERING  
TECHNOLOGY**

Ernest E. Mills, M.S., *Coordinator for Mechanical Engineering Technology*

**Professional Preparation***Aims*

The objectives of the program are the same as those listed for the Electrical Engineering Technology program.

*Description of Major*

Mechanical engineering technology deals with the use of machinery to harness power resources and perform useful work. In contrast to civil engineering, which deals primarily with static forces and structures, mechanical engineering is more concerned with the motion and kinetics of devices which are activated by hydraulic, electrical, mechanical, or thermodynamic forces. Major functions of the mechanical engineering technologist are:

- 1. Design and installation of all kinds of machinery, from pocket watches to the largest steel boring mills;
- 2. Development and production of engines and transport equipment (automobile, aircraft, ship, railway, etc.);
- 3. Construction and operation of furnaces and boilers, as well as heating and air-conditioning equipment, for the control of atmospheric and environmental conditions.

A View of the Five-Year Major



Since machinery is predominantly the concern of the mechanical engineer, the program of study is designed to give considerable training in the principles underlying the design and operation of engines, power transmission devices, machine tools, and other machinery. This, of course, implies a thorough study of the physical laws concerning motion and transfer of energy. Applied mechanics, thermodynamics, and study of materials will occupy prominent places in the program.

These studies will thus provide a student with a broad foundation in those fundamental subjects essential to the understanding of current practice. In the junior and senior years, a student will have considerable elective choice and opportunity for specialization.

The Sample Freshman-Year Program of Studies in Lincoln College is the same for all majors in the College. See page 104.

Basic Course Requirements

I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Algebra and Trigonometry I & II	8	*Physics Lab. I & II	2
*Calculus I	4	*Engineering Design	6
**Calculus A, B	8	Graphics I, II, III	6
*English	12	*Principles of Computer Programming I, II, III	6
Principles of Economics	4	Liberal Arts Electives	20
*Physics I, II, III	12	Technical Electives	20

II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
**Mechanics A, B	8	Mechanical Design	6
Mechanics C	4	Thermodynamics A, B, C, D	14
**Stress Analysis A	4	Fluid Mechanics A & B	6
Stress Analysis B	4	Nuclear Technology	4
**Materials	4	Mechanical Laboratory	6
Engineering Design	4	Heat Laboratory	4
Electricity and Electronics	4	Project Laboratory	4

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

## College of Liberal Arts

Walter S. Jones, Ph.D., *Acting Dean*

Ruth H. Karp, M.A., *Associate Dean*

Robert H. Ketchum, Ph.D., *Associate Dean, Director of Graduate School of Arts and Sciences*

### Professional Preparation

#### *Aims*

Programs in the College of Liberal Arts are aimed at developing intellectual maturity, or an awareness of the world and the ability to cope with its problems effectively and creatively. The mastery of concepts and methods of a specific discipline—and the insight it provides into the intellectual process itself—is inherent in every departmentally and individually designed curriculum. Northeastern's Cooperative Plan enhances the value of this approach by providing the opportunity to test knowledge with experience. Ultimately, the College seeks to give the student a lifelong love of learning.

#### *A View of the Four-and Five-Year Programs*

Although a wide range of courses is offered, enabling each student to plan a college program in keeping with his own interests and aptitudes, a definite series of basic courses in each curriculum is recommended by the faculty. Each student is guided in the selection of courses by a faculty adviser. During the sophomore year, each student tentatively selects a major field of specialization and thereafter, unless he changes his major, becomes closely identified with that field, its faculty, and other students in the same concentration.

In addition to the selection of a major area of study, students who have completed or are completing the sophomore year of study will be eligible to select a "minor" from among those Liberal Arts departments which offer them. Many departments are in the process of developing such minors as this publication goes to press. For examples of minors, please refer to page 136, under Philosophy.

All students in the College of Liberal Arts are eligible to participate in the Cooperative Plan which provides gainful employment or experiential assignments. In all Liberal Arts majors, students may choose between the five-year Cooperative Plan and a four-year, full-time program.

Students in the College of Liberal Arts may earn a Bachelor of Arts or a Bachelor of Science degree. For either degree, the student is initially admitted to the College in one of two broad areas of study: social sciences-humanities or sciences-mathematics.

Since the freshman-year program is different in each area, entrance requirements also vary.

All degree candidates must complete two quarters of Freshman English. They must also complete successfully the courses specified as required in their majors, and in addition, elective courses which bring the total number of quarter hours earned to 176. As part of their elective and required courses, all candidates for the Bachelor of Arts must include at least 40 quarter hours (10 courses) to meet

"distribution" requirements, and they must also satisfy a requirement for proficiency in a modern foreign language, as described under "Languages."

All course work offered in the College of Liberal Arts is identified as falling into one of three broad areas: humanities, social sciences, and science-mathematics. To satisfy distribution requirements, B.A. candidates must complete 40 quarter hours in the two areas outside of the major. For example, a major in History, which is considered a social science, must take 40 quarter hours in the science-mathematics and humanities areas, as identified below.

### **Humanities**

Art, Drama, Literature, Modern Languages (all courses except those elementary courses which are used to satisfy the language requirement), Music, Philosophy, Journalism, Speech.

### **Social Sciences**

Anthropology, Economics, History, Political Science, Psychology, Sociology.

### **Science and Mathematics**

Biology, Chemistry, Mathematics, Earth Sciences, Physics, Psychology (laboratory courses only). Note: A Psychology course may be used to meet requirements in only one distribution area.

To determine which distribution requirement a course meets, if selected from the interdisciplinary programs in Human Services or African-American Studies, students should consult a counselor in the dean's office.

### **Languages**

A candidate for the B.A. must attain a level of proficiency in a modern foreign language indicated by a passing grade in intermediate-level college courses or by meeting a comparable criterion. This requirement will be regarded as satisfied for students who earned an average grade of C or better in a full, four-year language sequence in secondary school and for students for whom English is a foreign language. Other students may satisfy the requirement by passing a proficiency examination. Students who have not met the requirement at matriculation will ordinarily take an intermediate-level course in the language presented for admission, but those with exceptionally weak preparation may be placed in a lower-level course for a quarter. Alternatively, a student may satisfy this requirement with two years (four quarters) of a new language.

### **Self-Planned Program**

#### *Independent Major*

A student may petition the Dean of the College to meet the requirements of the B.A. degree with an independent rather than a departmental major. The petition must include a proposed program which the student intends to follow. Based on the theme of his petition, he will be assigned to an appropriate faculty adviser. Requirements for the major should be discussed in advance with a counselor in the Dean's office.

### **Human Services**

An interdisciplinary program leading to the Bachelor of Arts is offered for students interested in careers in the Human Services. The Human Services major is designed to give the student a broad and com-



prehensive view of the needs of society and the variety of ways in which the individual may contribute toward meeting them. Involving the Colleges of Criminal Justice, Education, and Liberal Arts, this program prepares students for entry into a wide variety of social service occupations. For details of the program and professional possibilities see pages 166 and 167.

### **Placement Techniques**

During the last year students in all curricula may take Placement Techniques, a course designed to prepare them for placement in their chosen vocational or professional field. Under expert guidance, each student studies career opportunities, prepares a complete personnel record, and works out a plan for obtaining employment after graduation.

Students who undertake the Cooperative Education Program must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

### **Honors Programs**

Each year, upon admission to the University, a small number of carefully chosen freshmen are invited to participate in the Honors Program. Selection is based on a student's academic promise as reflected in past achievement, strong recommendations from secondary schools, and high scores in College Entrance Examination Board tests.

Participation in the Honors Program is more than a mark of recognition. It allows flexibility in planning a course of study and permits the election of courses otherwise unavailable to freshmen. For example, Honors Freshmen meet the freshman English requirement with Honors English, a two-quarter program designed to encourage creative writing and literary analysis. They may choose one of the Honors Colloquia for full-course credit on a pass-fail basis, a privilege ordinarily accorded in the second or third year. The Colloquia are seminars on topics which change annually. Enrollment is strictly limited to provide the best atmosphere for the exchange of ideas and closer contact with faculty and students.

At the end of either the freshman or sophomore year, students with a sufficiently high average are notified of their eligibility to join the Honors Program whether or not they were Honors Freshmen. Sophomores and middlers who join are then free to enroll in a Colloquium of their choice.

Juniors and Seniors with a cum of 3.0, no I's or F's, and no grade below B in their major field are invited to do Honors work during three of their last four quarters. Departments design their own Honors programs which may involve seminars, independent study, or special research leading to a thesis. The program allows leeway for students to develop their special talents and interests, but it will be carefully supervised by the faculty adviser, after the Honors proposal is approved by the Honors Committee.

Students who successfully complete three quarters of Honors work are awarded Departmental Honors on graduation.

Further information is available at the Office of the Dean.

### **Preprofessional Advising**

#### *Premedical*

After deciding on his goal, a student preparing for a career in medicine, osteopathy, veterinary medicine, dentistry or other related

areas should arrange a brief interview with the chairperson of the Premedical Advisory Committee and with the Department of Graduate Placement Services, 132 United Realty Building, as soon as possible to learn about the minimal curricular requirements for admission to professional schools, and the scheduling of the required Medical College Admissions, Dental Aptitude, or other tests. These tests should be taken more than a year before the anticipated admission date.

#### *Combined Program with Professional Schools*

Students who have completed at least three-quarters of the work required for the baccalaureate degree at Northeastern University and are accepted into an approved professional school of medicine, osteopathy, veterinary medicine, or dentistry will be granted the Bachelor of Arts or Bachelor of Science degree at the end of the second year in professional school, provided at least two-thirds of the work for the baccalaureate degree has been earned in residence at Northeastern. The residence requirement at Northeastern University must have been completed immediately prior to entrance into the professional school. Under this plan, preprofessional students may reduce by one year the time ordinarily required for obtaining both degrees.

#### *Prelegal*

Students preparing for a career in law should arrange for an interview with the Prelegal Advisory Committee in the Department of Graduate Placement Services, 132 United Realty Building, to learn about general curricular requirements for admissions to schools of law, the scheduling of the required Law School Admission Tests, and the best times to take them.

#### *Note*

If they include the minimal number of courses required by the particular professional school, students aiming for admission to a school which provides training in a medical profession or the law may meet admissions requirements through a wide choice of majors. If at all uncertain about the appropriate major to select, such students should discuss program requirements with a counselor in the Dean's Office and a preprofessional adviser in the Department of Graduate Placement Services, 132 United Realty Building.

## **Graduation Requirements**

### *Degrees*

The College of Liberal Arts awards the Bachelor of Arts degree to qualified candidates who have completed one of the curricula outlined on the following pages.

The College of Liberal Arts offers the Bachelor of Science degree to candidates who meet the program requirements. Students should formally notify the dean's office of their intention to pursue the B.S. degree program if it is offered in their major.

#### *Quantitative*

Candidates for either degree, starting with those entering at any level in the Fall quarter of 1974, must successfully complete 176 quarter hours of credit. Those who entered earlier as freshmen or transfer students should discuss their total degree requirements with a counselor in the Dean's office.

*Qualitative*

A cumulative average grade of C is required for graduation.

*Residency*

Either the last three full quarters (a minimum of 12 courses) or at least 75 percent of the credit for the degree must be taken at Northeastern to satisfy the residency requirement.

**Graduation with Honors**

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must attend the University at least six quarters to become eligible for honors at graduation.

Transfer students who have completed at least three full quarters of course work (a minimum of 12 courses) at honors level in the College of Liberal Arts may be permitted to graduate with honors, provided that work completed at other institutions, when weighted and averaged in with Northeastern work, equals the University's level. The degree of honors posted on the Northeastern diploma and transcript, however, shall be no higher than the honors-level attained at the University.

**Accreditation**

All programs in the College of Liberal Arts are fully accredited by the New England Association of Schools and Colleges.

**The Freshman Program**

The full year's program for a freshman will consist of courses in five or six different subjects, depending on a student's intended major. Students take four courses each quarter—a total of 12 for the year.

Examples of six-subject programs are shown below; however, these are only two of many possible combinations of courses students may select in their first year.

**Sample Freshman-Year Programs of Studies in the College of Liberal Arts**

Following is a program that might be geared to majors in African-American Studies, Art History, Drama, Economics, English, History, Human Services, Journalism, Modern Languages, Philosophy, Political Science, Psychology, Sociology/Anthropology, and Speech Communication.

*First Quarter*  
Political Science  
Spanish  
Art  
Math

*Second Quarter*  
Art  
Spanish  
English  
Sociology

*Third Quarter*  
English  
Math  
Anthropology  
Political Science

A sample program that might apply to majors in Biology, Chemistry, Geology, Mathematics, and Physics follows:\*

*First Quarter*  
Calculus I  
General Chemistry I  
English  
German

*Second Quarter*  
Calculus II  
Physics  
General Chemistry II  
German

*Third Quarter*  
Calculus III  
Analytical Chemistry  
English  
Sociology



Freshman students in the College of Liberal Arts have the opportunity to choose courses from the following subjects:

American History	Music
Anthropology	Philosophy
Art	Political Science
Astronomy	Psychology
Economics	Russian
English	Science and Black Society
Foundations of Black Culture	Spanish
French	Sociology
Geography	Theatre
Geology	Western Civilization
German	
Human Services	
Italian	

In addition, separate courses, differing in focus and approach, are available in each of the following subjects listed below; one approach is designed for science-oriented students, others for social science- and humanities-oriented students.

Biology	Mathematics
Chemistry	Physics

*\*In addition to the above courses, a student may elect to take ROTC.*



## AFRICAN-AMERICAN STUDIES DEPARTMENT

Ramona H. Edelin, M.A., *Assistant Professor and Chairperson*

Dr. Stanlake Samkange, Ph.D., *Professor*

Dr. William D. McLaurin, Ph.D., *Associate Professor*

Holly M. Carter, M.A., *Instructor*

Daniel O. Nyangani, M.A., *Instructor*

### Professional Preparation

#### *Aims*

The goal of the program of African-American Studies is that of a liberal education anywhere and at Northeastern in particular: an enhanced appreciation of one's cultural heritage and the intellectual foundation for a rewarding career. Consistent with these goals, and appropriate to the University's avowed concern for the local community, the program of African-American Studies has as its central themes: 1) the cultural heritage and the societal problems peculiar to Americans of African descent, and 2) the preparation of black Americans for rewarding careers by supplementing traditional career-oriented courses in other programs with new courses that focus on career development specifically for black persons.

The first of these two themes is addressed as much to white students as to black, due to the fact that the traditional academic presentation of our Western culture has consistently been seriously narrowed and limited by the virtual exclusion of its African-American contributions and components. A truly liberal education should enable the student to appreciate the many distinct ways different individuals and peoples view the world. This can be accomplished academically by providing the intellectual opportunity for the sharpening of cross-cultural insights which, in turn, will serve to unite the human family by building greater human understanding, the foundation-stone of all knowledge.

To the extent that the black experience in America is, in part, a separate one, the non-black's ignorance of that part of our life and culture has in many ways helped to contribute to our nation's racial problems. The many young non-black people who sincerely want to contribute to the solving of these problems will have the opportunity to do so through this program which offers a far deeper study of black culture than previous curricula.

The second theme is based on the recognition that, although career doors are opening more widely to blacks, many of the old inter-cultural barriers to satisfaction and fulfillment in these careers still persist, while new barriers are perhaps forming as well. The future black professional can greatly benefit by the study of these inter-cultural problems as a meaningful supplement to the study of the subject matter area of the profession.

### *Description and A View of the*

#### *Major*

The major will lead to a B.A. or B.S. degree and may be completed in four or five years. Courses taken in the Department of African-American Studies will be credited toward degree requirements for all Liberal Arts students.



Students will be able to elect the major in African-American Studies at any time from the freshman to the middler year. With careful supervision from the student's counselor, programs of study which best suit the student's goals will be developed. Distribution and language requirements will also be provided for in this manner.

A student will be required to take Freshman English, Foundations of Black Culture I & II, Science and Black Society I & II, African-American History, African-American Literature, African Civilization I & II, Educational Issues for Black Americans, Black Community and Social Change, Contemporary Problems in Black Society, Economic Problems of Black Americans, a Field Seminar, and Directed Study for Senior Thesis.

Counselors will aid students in choosing recommended electives. A partial listing includes courses from such general categories as statistics, political science, sociology, psychology, or language arts, as well as specific electives, such as Third World Political Relations, The Black Novel, The Black Family, Seminar: Ellison/Wright, and Black Ideologies.



## ART DEPARTMENT

Robert L. Wells, M.A., *Professor and Chairman*

### FACULTY

#### Associate Professors

Samuel Bishop, M.A., M.F.A.

Ronald Davis, M.Ed.

Wheaton Holden, Ph.D.

Peter Serenyi, Ph.D.

#### Lecturers

Joyce Bezdek, M.F.A.

Stephen Elston, M.A.

### Professional Preparation

#### Aims

The Art Department aims to introduce all interested students to the various forms and styles of expression in the visual arts and offers a major in Art History.

#### Description of Major

Courses cover the evolution of architecture, sculpture, painting, graphic arts, photography, and film art with emphasis on styles, techniques, and cultural implications—some from prehistoric times to the present. Studio courses are also offered in areas of painting, drawing, graphic arts, photography, filmmaking, and animation filmmaking. Students will obtain a working knowledge of the structure of art, as well as preparation for graduate school and a career.

#### A View of the Major

For the student interested in majoring in Art History, members of the Department will offer individual guidance in the selection of courses best suited to individual goals.

Art History majors are required to include the two-part course in the History of Art, two studio courses, and ten Art History courses, one elective each in philosophy and music, and two courses in history.

The candidate for the Bachelor of Arts degree must also show proficiency in a foreign language through the collegiate intermediate level, or must take courses to reach that level. The Bachelor of Science program, which does not include a modern foreign language requirement, offers more concentration in the major area.

Graduates with a degree in Art History may enter related areas, such as museum work, or continue with preparation for careers as teachers, researchers, or writers.

## BIOLOGY DEPARTMENT

Henry O. Werntz, Ph.D., *Associate Professor and Chairman*

### FACULTY

#### Professors

Francis D. Crisley, Ph.D.  
Janis Z. Gabliks, D.D.S., Ph.D.  
Charles Gainor, Ph.D.  
Abdul-Karim Khudairi, Ph.D.  
Nathan W. Riser, Ph.D.  
Fred A. Rosenberg, Ph.D.

#### Associate Professors

Charles H. Ellis, Ph.D.  
Helen Lambert, Ph.D.  
Charles A. Meszoely, Ph.D.  
M. Patricia Morse, Ph.D.  
Joseph V. Pearincott, Ph.D.  
Ernest Ruber, Ph.D.

#### Assistant Professors

Paul G. Arnison, Ph.D.  
Kostia Bergman, Ph.D.  
William C. Hartner, Ph.D.  
Gwilym S. Jones, Ph.D.  
Dale F. Levering, Ph.D.  
John A. Patterson, Ph.D.  
Daniel C. Scheirer, Ph.D.  
Phyllis R. Strauss, Ph.D.

### Professional Preparation

#### *Aims*

The Biology major offers students a fundamental understanding of the organization and the processes of life, from the level of molecules and cells through the level of organs and organ systems to the level of populations, species, ecosystems and evolution. The major also provides the mathematical, chemical and physical background necessary to understand biology. Further, it trains students in practical scientific skills associated with each of these areas of study. Finally, it allows students to begin to specialize in a subdiscipline of biology.

#### *Description of Major*

The major consists of ten biology courses in addition to those required in chemistry, physics, and mathematics. Six of the biology courses constitute a required core sequence: General Biology, Animal Biology, Plant Biology, Environmental and Population Biology, Genetics and Developmental Biology, and Cell Physiology and Biochemistry. A student normally should take the core before taking a required minimum of four upperclass biology electives. It is usually possible to follow the prescribed sequence if a student has decided on the major in the freshman or sophomore year. For students who may enter the major in the middler year, it is often possible to complete the major in the normal time by taking some of the electives concurrently with core requirements, providing they have previously taken freshman-level science and mathematics.

There are two programs within the Biology major, one leading to the Bachelor of Arts degree and the other to the Bachelor of Science degree. The B.A. program retains the Liberal Arts requirements in humanities and social sciences; the B.S. program is more rigorous and more extensive in its mathematics and science requirements and thus provides better preparation for post-graduate study. The difference is mainly one of emphasis, however, and it is possible for a student to meet both sets of requirements.

After completing the core program, students interested in independent research may arrange with individual faculty to undertake Di-





rected Study; if eligible, they may be invited to undertake a more extensive Honors Program involving up to four quarters of research.

The Department publishes a guide to required and recommended courses for the Biology major—*The Biology Undergraduate Advisory Handbook*—which students would do well to obtain as early as possible in their career at Northeastern. The handbook is available in the Biology Office, Room 403, Richards Hall.

#### *A View of the Major*

The Biology Major is excellent preparation for a wide variety of careers or professions in the life sciences, including medical, dental, and other health-related professions. Graduate study leading to a master's degree or doctorate can open careers in upper-level teaching and/or research in one of the specialized areas of biology, such as zoology, botany, microbiology, physiology, ecology, marine biology, cell biology, or biochemistry. Biology majors may also go into post-graduate training in such health-related areas as nutrition, public health, or medical technology.

Biology majors not wishing to enter either professional or graduate schools may find employment on technical levels in federal, state, industrial, hospital or university laboratories doing research, survey, or quality control in a biological area. They may enter directly into positions in industries involved in the manufacture and distribution of pharmaceuticals, biological products, food, or scientific equipment. Many biologists are employed at all levels in fisheries, forestry services, county agencies, museums, aquariums, research vessels, and marine stations.

Preprofessional students (for example, premedical or predental) are urged to consult with the preprofessional advisory committee early in their careers at Northeastern. *Students are cautioned that the successful completion of the required preprofessional courses by no means ensures admission to a professional school since the number of applicants usually far exceeds the space available.*

#### **Laboratories**

The Biology Department has specially equipped teaching laboratories for general biology, botany, anatomy, microbiology, microscopy, physiology, zoology, and cell biology. Equipment for field work, museum specimens, models, charts, and closed circuit television are employed in laboratory instruction. Additional facilities include aquarium and animal rooms, stockrooms, preparation rooms, research areas, and a large suburban greenhouse and woodlot. The Department has close association with the University's Marine Science Institute at Nahant and with the University's Electron Microscopy Center.

## CHEMISTRY DEPARTMENT

Karl Weiss, *Chairman*

John L. Roebber, *Executive Officer*

### FACULTY

#### Professors

Bill C. Giessen, Dr. Sc.Nat.

Barry L. Karger, Ph.D.

Robert A. Shepard, Ph.D.

Alfred Viola, Ph.D.

Karl Weiss, Ph.D.

#### Associate Professors

Geoffrey Davies, Ph.D.

David M. Howell, Ph.D.

Conrad M. Jankowski, Ph.D.

Elmer E. Jones, Ph.D.

Philip LeQuesne, Ph.D.

William M. Reiff, Ph.D.

John L. Roebber, Ph.D.

Efthalia J. Spinos, M.S.

Robert N. Wiener, Ph.D.

#### Assistant Professors

Thomas F. Brennan, Ph.D.

Thomas R. Copeland, Ph.D.

Arthur M. Halpern, Ph.D.

James E. Quick, Ph.D.

David Seitz, Ph.D.

#### Supervisor of Laboratories

Bernard J. Lemire, B.S.

### Professional Preparation

#### *Aims*

The educational objectives of the Chemistry Department are (1) to provide students with the intellectual stimulation of studying a physical science, (2) to impart a firm grasp of the basic principles and techniques which are central to a variety of chemistry-related careers, and (3) to prepare students for graduate study in chemistry. These objectives are implemented by the Department's highly research-oriented faculty, which consists of experts in various fields of the science.

#### *Description of Major*

Chemistry is concerned with the structure and properties of substances, and with the transformations they undergo. The boundaries between the classical areas of analytical, inorganic, organic, and physical chemistry are no longer distinct. Moreover, significant overlaps have developed between chemistry and the fields of biology, physics, mathematics, medicine, and engineering. These trends are reflected in the Chemistry Major programs at Northeastern.

Modern chemistry is the cornerstone for a large number of professions and industries. Challenging career opportunities exist in almost all technical fields in which functions such as research, development, production, sales, market analysis, quality control, and management are involved. The Chemistry Major programs provide excellent preparation for the study of medicine, dentistry, and veterinary medicine, and for advanced study in many fields of science. Additional benefits accrue to students by participation in the cooperative work program in chemistry. The practical experience gained in the field not only enhances employment prospects on graduation, but it also places chemistry in a more realistic perspective than does academic training alone.

#### *A View of the Major*

The Department offers two major programs which lead to the B.S and B.A. degrees, respectively. Both are normally based on the five-year cooperative study plan, but academically equivalent four-year study options are also available. The two degree curricula differ mainly in their traditional liberal arts content and advanced science course requirements. The Department has a committee of advisers who provide aid in choosing courses and other curricular matters for students at all levels.

The Chemistry Major programs at Northeastern are based on a novel, career-oriented concept. To provide basic training for a variety of careers, a core of rigorous basic chemistry and science courses is flexibly augmented with selected courses in other areas. These career options include:

Preprofessional Study (Medicine, Dentistry, Veterinary Medicine)

Teaching and Research *via* Graduate Study

Technical Employment in Industry

Geochemistry, Mineralogy, and Environmental Chemistry

Clinical Chemistry, Medicinal Chemistry, and Pharmaceutical Research

Chemical Sales and Management

Forensic Chemistry



The variety of careers open to persons with a strong background in chemistry is extensive, and other options can be constructed from the large number of courses offered at the University.

The core curriculum is common to all options. It consists of courses in English, calculus, physics and basic chemistry, which are taken in the freshman year. Students may be exempt from the General Chemistry courses by passing equivalency tests; in this case other courses are substituted. In the upper years, courses in Organic, Inorganic, Physical, and Analytical Chemistry are taken. For the B.S. degree, some additional advanced mathematics and science courses are required. German or Russian is strongly recommended for students who plan to pursue graduate study in the sciences.

Qualified students are encouraged to undertake a research project under the supervision of a faculty member. An honors program is open to especially able students.

#### **Accreditation**

The Chemistry programs at Northeastern are approved by the American Chemical Society. The B.S. degree meets the society's requirements for certification.

#### **Facilities and Research**

The main facilities of the Chemistry Department are housed in Hurtig Hall, a modern, air-conditioned, five-story building which contains equipment for up-to-date teaching and research. All faculty offices are located there, as is the James Flack Norris Room, which serves as a lounge for undergraduate chemistry majors. Additional research facilities are located in the Forsyth Building, (Photochemistry and Spectroscopy Laboratory), and in the Institute of Chemical Analysis, Applications, and Forensic Science. The Department's major research equipment includes electron microscopes, a mass spectrometer, lasers, X-ray diffractometers, nuclear magnetic resonance and electron spin resonance spectrometers, Gouy and Faraday magnetic balances, photoelectron and electron impact instrumentation, Mossbauer spectrometers, and a variety of ultraviolet and infrared spectrometers. Much of this equipment is available to undergraduates in advanced courses or working on research projects.

Active research programs exist in synthetic and mechanistic organic chemistry, natural products chemistry, inorganic chemistry, chemical oceanography, photochemistry and spectroscopy, separation science, and solid state chemistry.



## **DRAMA AND SPEECH DEPARTMENT**

Eugene J. Blackman, M.A., *Professor and Chairman*

### **FACULTY**

#### **Professor**

Mort S. Kaplan, M.A.

Jerrold A. Phillips, Ph.D.

Patricia H. Sankus, M.A.

Richard Schreiber, M.F.A.

#### **Associate Professors**

Carl W. Eastman, M.A.

Michael L. Woodnick, M.S.

#### **Instructor**

Gail F. Holbrook, M.A.

#### **Assistant Professors**

Marcia M. Littlefield, M.S.

John T. Marlier, Ph.D.

#### **Technical Director**

Peter N. Glynn, M.F.A.



## **DRAMA**

### **Professional Preparation**

#### *Aims*

Theatre, one of the most ancient of all art forms, is still a moving force in our society because it uniquely involves the spectator to a degree unmatched by most creative and communicative arts.

At Northeastern, the student in drama can prepare for careers in educational and professional theatre, as well as acquire the background for advanced study at a graduate institution.

#### *Description of Major*

The undergraduate Drama major will be introduced to the total theatre experience, as well as its individual arts and crafts.

Theatre history, dramatic literature, playwriting, as well as acting, directing, technical production, scene design, lighting design, costume design, voice control, and stage movement are only some of the

areas covered in classroom courses. Theory will be tested in the theatre laboratories—the stages and their shops. The Drama majors are encouraged to express individual creative and interpretive impulses in courses, laboratory classes and the working crews and casts of productions. They will do so with an awareness of controlled technique. Advanced students will be urged to demonstrate abilities in independently organized but faculty-supervised projects in acting, playwriting, criticism, directing, and design.

### *A View of the Major*

It is recommended that Drama majors take a Physical Education *skill* course during each of the quarters in residence. The following courses, when available, are recommended: Modern Dance, Ballet, Jazz Dance, Tumbling, Gymnastics, Judo, Boxing, Wrestling, Fencing, Weight Training, Physical Conditioning, Exercise and Physical Control, and/or Swimming.

It is also recommended that the Drama major have at least a basic familiarity with the other creative arts as well as the basic humanities. When practicable, the major should take course work in the following areas outside the major field of concentration: music, art, philosophy, American and English literature.

The difference between the B.A. degree and the B.S. degree is one of flexibility and concentration. The B.S. degree allows the substitution of specialized field courses for the usual Liberal Arts distribution and language requirements.

However, there are minimum requirements for both degrees, with 60 quarter hours to be taken in the major area. Thirty-two quarter hours are to be taken in: History of the Theatre I & II, Voice and Articulation, Speech for the Theatre, Stagecraft, Practicum in Play Production, Acting I, and Directing I. Twenty-eight quarter hours are to be taken in any of the advanced Drama and Speech courses offered, some of which are: Make-Up, Acting II, III, Directing II, Stage Movement, Theatre Management, and Directed Studies for advanced students.

The theatre represents the major public laboratory to the Drama major, a place where theory is put into practice. All majors are expected to work in production each quarter in residence and fulfill a variety of crew assignments in construction, painting, sound, lighting, sewing, and ticket selling, as well as crew assignments for the running of a show—wardrobe, make-up, props, scene shifting, ushering, and house managing. Whenever possible, majors are expected to serve as stage managers and assistant stage managers. Appearing in a production is not a substitute for crew work and, when reasonably possible, all those concentrating in a performance aspect should also participate in crew activities.

A few places are kept available in upper-class performance courses for freshmen.

### **Accreditation**

Basic course work offered by this Department more than satisfies the minimum undergraduate requirements for a Drama degree as suggested by the American Theatre Association and prepares the student to take the Graduate Placement Examination in Theatre.



## **SPEECH COMMUNICATION**

### **Professional Preparation**

#### *Aims*

In the Speech Communication Major, the Department seeks to stimulate the personal and professional growth of the student through a study of the principles and methods of communication.

Courses are designed to give students an understanding of the communication processes and the role of communication in society. The speech communication program provides both theoretical and experiential learning to increase self awareness and personal development.

Classes are offered in the *Mass and the Media*, *Explorations in Communication*, *Interpersonal Communications*, *Oral Interpretation*, *Business and Professional Speaking*, and others.

The objectives for the Speech Communication Major are three-fold:

1. To stimulate the student's personal growth and development in perception and self-expression through the study of historical, contemporary, and artistic aspects of speech, and to provide organized knowledge and critical insight;
2. To prepare the student for professions which require both a theoretical and technical knowledge of communication, such as education, the law, government service, public relations, advertising, social service, industrial communications, and the arts;
3. To prepare the student for advanced graduate study in group and public communication, public address, oral interpretation, and speech education.

### **Professional Preparation**

#### *Overview*

Students may receive either a B.A. or a B.S. through a concentration in Group and Public Communication or Personal Performance.

It is recommended that the student interested in the Group and Public Communication concentration select elective courses that are appropriate to his/her area of interest in the Departments of Psychology, Sociology, Political Science, Philosophy, and English.

Students interested in the Personal Performance concentration should elect courses from the Departments of Drama, English, Education, and Philosophy.

## EARTH SCIENCES DEPARTMENT

Richard S. Naylor, Ph.D., *Associate Professor and Chairman*

### FACULTY

#### Associate Professors

Bernard L. Gordon, M.S.  
David L. Wilmarth, Ph.D.

#### Assistant Professors

James R. Allen, Ph.D.  
Richard H. Bailey, Ph.D.  
William A. Newman, Ph.D.  
Gerald D. Prager, Ph.D.  
David S. Westerman, Ph.D.

### Professional Preparation

#### *Aims*

The Department of Earth Sciences offers a degree program in geology in the College of Liberal Arts as an in-depth study of a major area of the earth sciences, as well as courses in geology, geography, oceanography, and astronomy, which are available to all students.

#### *Description of Geology Major*

Geology is a broad-based science which deals with the study of the physical features, composition, history and processes of the earth. The manufacture of an enormous number of products composed of metals and petroleum derivatives is the basis of the economy of our society. The understanding of the origins of these natural resources and of how to assure their continued supply is one of the major roles of today's geologists. Only a small portion of the earth has been studied in detail, leaving many unexplored frontiers for each new graduate in the field.

#### *A View of the Major*

Since the study of geology also draws on information from the other physical sciences, students should complete basic courses in chemistry, physics, and mathematics along with Physical and Historical Geology during their first two years. After completing the introductory geology courses and one year of chemistry, every Geology major takes a three-course sequence—Descriptive Mineralogy, Optical Crystallography, and Optical Mineralogy. A knowledge of minerals is fundamental to geological understanding. In addition to the required introductory and mineralogy courses, the student chooses a minimum of six (for the B.A. degree) or eight (for the B.S. degree) additional geology courses. There are also electives required in the areas of the humanities and social sciences.

Each student is assigned to an adviser in the Department. The adviser assists the student in making appropriate course selections as his knowledge increases and special interests develop. Though not required, courses in petrology, structural geology, and paleontology are usually among the electives chosen by undergraduates.

During the junior and senior years, a student may select undergraduate research as one of his elective courses. Under the supervision of a faculty member, a problem is selected, defined, and researched. These projects give the undergraduate the opportunity to go much more deeply into some aspect of geology that holds particular interest for him/her. Students who meet the college re-

quirements for the honors program may also be invited to carry out an undergraduate research project.

### **Special Information**

#### *Field Trips*

Though much geology can be learned from textbooks and in the laboratory, a sound geological education must also include direct contact in the field. Whenever it is appropriate, field work, on an individual or group basis, will be part of individual courses. The Department also offers two extended field trips each year in the fall and spring quarters. These trips are usually three or four days in length to areas in the Northeast of particular geologic significance. Geology majors are expected to participate in these trips.

## **ECONOMICS DEPARTMENT**

Morris A. Horowitz, Ph.D., *Professor and Chairman*

### **FACULTY Professors**

Harold M. Goldstein, Ph.D.  
Irwin L. Herrnsstadt, Ph.D.  
Sungwoo Kim, Ph.D.  
Peggy Musgrave, Ph.D.  
Gustav Schachter, Ph.D.  
Donald Shelby, Ph.D.

### **Associate Professors**

Conrad P. Caligaris, Ph.D.  
Ernest M. DeCicco, Ph.D.  
Daryl Hellman, Ph.D.  
Pawan K. Sawhney, Ph.D.

### **Assistant Professors**

Philip Abbott, Ph.D.  
Y. Lal Mahajan, Ph.D.  
Francis Mulvey, Ph.D.  
Joel Naroff, Ph.D.  
Andrew Sum, M.A.

### **Instructors**

Robert Hankin, Ph.D.  
Charles Harrington, M.A.  
Bruce Kutnick, M.A.  
Edward Meehan, M.A.  
Donna Olszewski, M.A.  
Mohammed Rahman, M.A.  
John Silvia, M.A.  
Frank Tortora, M.A.  
Ralph Tryon, M.A.

### **Professional Preparation**

#### *Aims*

The aims of the economics program are to provide University graduates with a better understanding of how our economy and other economies function, to prepare students for graduate study in economics, and to develop specialists who are qualified to work as economists.

#### *Description of Major*

Economics is the study of the ways in which scarce resources, including human resources, are deployed to satisfy the material wants of individuals and society. Economists analyze the factors which determine the success or failure of this process.

Macroeconomics, which is concerned with the economy overall, deals with such problems as inflation, unemployment, growth and instability, and government monetary, fiscal, and regulatory policies. Microeconomics is concerned with the economic behavior of individuals, households, firms, and industries. It assesses the economic effect of racism, sexism, pollution, and environmental damage; it analyzes the economic aspects of natural resources, poverty, health, income distribution, trade unions, and collective bargaining.

Graduates are employed by businesses in such activities as industrial relations, planning and forecasting, determining plant locations, and making financial studies. They may become expert in analyzing consumer demand and developing and marketing new products. They may conduct research or teach, and/or provide specialized consulting services. Federal, state, local governments and trade unions are important sources of jobs for economists.

A graduate with an economics major, or a number of advanced courses, is not only better prepared for graduate programs in economics but may be better prepared, as well, for entry into schools of law and business.

#### *A View of the Major*

There is considerable flexibility in the economics program to enable the student to concentrate in the areas of his or her own interest. A student expecting to major in the field should take the problem-oriented Principles of Economics in the freshman or sophomore year to discover the range of insights economics can offer in analyzing and solving a variety of problems. Upper division courses apply theory to an in-depth study of a specific area of the field.

Other courses for the major include two quarters each of fundamentals of mathematics, economic statistics, and economic theory. In addition, the Department offers electives in all areas of economics, honors courses, reading courses, and a senior seminar.

The courses listed above are required for either the Bachelor of Arts or Bachelor of Science degree. However, the B.A. follows the liberal arts tradition in its distribution and language requirements; the Department of Economics requires other social science courses as well, plus six economics electives. The B.S. is a professionally oriented degree. In addition to social science electives, it requires ten economics electives and one course in quantitative methods.

The Department courses provide training in economic theory, money and banking, public finance, international trade, growth and development, industrial organization, comparative economic systems, economic history, environmental economics, economics of crime, urban problems, labor markets, collective bargaining, human resources, poverty and discrimination, and medical economics. In addition, tool courses, such as statistics, mathematical economics, econometrics, and quantitative methods are available. Other electives and readings courses permit a student to study an area in depth.

## ENGLISH DEPARTMENT

Gordon E. Pruett, Ph.D., *Associate Professor and Acting Chairman*

### FACULTY Professors

Raymond E. Blois, Ph.D.  
Victor E. Howes, Ph.D.  
Samuel F. Morse, Ph.D.  
Robert B. Parker, Ph.D.  
Kinley E. Roby, Ph.D.  
Stanley Trachtenberg, Ph.D.  
Arthur J. Weitzman, Ph.D.  
Paul C. Wermuth, Ph.D.

### Associate Professors

Samuel J. Bernstein, Ph.D.  
Robert J. Blanch, Ph.D.  
Francis C. Blessington, Ph.D.  
Irene Fairley, Ph.D.  
Gary Goshgarian, Ph.D.  
Gerald R. Griffin, Ph.D.  
M. X. Lesser, Ph.D.  
James E. Nagel, Ph.D.  
Jane A. Nelson, Ph.D.  
Lloyd A. Skiffington, Ph.D.  
Herbert L. Sussman, Ph.D.  
Joseph E. Westlund, Ph.D.

### Assistant Professors

Candace Brook, Ph.D.  
E. Wallace Coyle, Ph.D.  
Timothy R. Donovan, Ph.D.  
Joseph Harwitz, Ph.D.  
Guy Rotella, Ph.D.

### Instructors

William E. Biddle, M.A.  
Albert d'Amato, M.Ed.  
Gerald Griswold, M.A.  
Kelly Reed, M.A.  
Penelope Tzougros, A.M.  
Marilyn Wakstein, M.A.  
Michael West, M.A.

### Lecturer

Joseph B. DeRoche, M.F.A.

## Professional Preparation

### Aims

The English Department curriculum is diverse in its aims and flexible in its design. For the general University community, the curriculum offers possibilities in creative and expository writing, linguistics, and American, English, and foreign literature. For the preprofessional student—in law, medicine, business, or engineering—it offers a broad intellectual and cultural frame for specialist concerns. For the major in English, it offers substantial preparation for careers in teaching and research, advertising and publishing, radio and television—indeed, any field in which communication and judgment go hand-in-hand.

At a time when the price of imprecision in language is more than simple misunderstanding, and the cost of changing values more than personal uncertainty, the study of literature provides “a momentary stay against confusion.” It deals with the hard edge of being, an insight into the ways of men and women, at once clear and complex. In fact, the very structure of literature gives shape and meaning to the often formless experiences of life. And it does so with grace and force. To put it another way, literature “tells it like it is,” not statistically, not abstractly, but with the details of fully realized people in accessible worlds, “imaginary gardens with real toads in them.”

### Description of Major

There is flexibility enough in the curriculum requirements and its details to accommodate the pace and interest of a wide range of stu-

dents. After an initial introduction to the study of literature in the two-part survey and the poetry analysis course, a student is free to choose the order of required areas, whether it is Chaucer or Pope and Swift, the Romantic poets, or the contemporary ones. Members of the Department are available throughout the year to help and advise a student, but the critical choice of order is his. So, too, is the choice within areas. The American literature requirement, for example, is met by successfully completing any two courses in it. Among the current offerings are Major American Novels, The New England Renaissance, American Realism, American Romanticism, and African-American Literature. To this area, as to others, the Department regularly adds new courses and, hence, even more options.

### *A View of the Major*



The curriculum for major concentration in English consists of 13 to 15 four-quarter-hour courses beyond the freshman level (depending on whether the student is working toward the B.A. or B.S.) distributed in the following way: a two-part survey of English literature; poetry analysis; Introduction to Linguistics or The History of the English Language; a course in each of three periods of English literature, Medieval, 18th century, and 19th century; Shakespeare; any two courses in American literature, and such electives as Creative Writing, Science Fiction, Images of Women in Literature, and The Novel of Violence. In addition, six seminars, limited to 15 senior students, are offered each year in subjects as varied as The Arthurian Legends, The Traveller in America, and Literature and Psychoanalysis. There are also opportunities for studies in language and literature, independent of formal course offerings. Student and instructor get together informally to pursue ideas of mutual and particular concern.

## **HISTORY DEPARTMENT**

Raymond H. Robinson, Ph.D., *Professor and Chairman*

### **FACULTY**

#### **Professors**

Philip N. Backstrom, Ph.D.  
Martha E. François, Ph.D.

#### **Associate Professors**

Charmarie Blaisdell, Ph.D.  
Ballard C. Campbell, Ph.D.  
William Fowler, Jr., Ph.D.  
Norbert L. Fullington, Ph.D.  
Donald M. Jacobs, Ph.D.  
John D. Post, Ph.D.  
Stanley R. Stembridge, Ph.D.

#### **Assistant Professors**

Gerald H. Herman, M.A.  
LaVerne Kuhnke, Ph.D.  
Clay McShane, Ph.D.  
Martin R. Ring, Ph.D.

#### **Lecturer**

Robert H. Ketchum, Ph.D.

### **Professional Preparation**

#### *Aims*

History's concern with man in his diverse and complex past provides excellent opportunity for the development of greater understanding and appreciation of today's culture and civilization. Traditionally, history has been a major of great appeal to men and women desiring a



broad base before they embark on careers in business, law, journalism, and government.

Other majors know that they want to work more directly in history. Some want to teach in public schools. They may elect education courses leading to certification by the state. (Those desiring jobs in private secondary schools need not be certified by state authorities.) Teaching positions in colleges and universities require master's, and increasingly, doctor's degrees. An undergraduate major in History facilitates entrance to graduate programs in the field. Ordinarily, college and university teachers of history spend part of their time in research and writing.

Not all professional historians teach and write. Many find pleasure and profit working in public archives, private historical societies, museums, and restoration projects. Their careers not only serve other professional historians but a larger public as well.

### *Description of Major*

For majors of such diverse interests and ambitions, curricula must combine sensible structure with flexibility. Majors in History at Northeastern may qualify for either a Bachelor of Arts or a Bachelor of Science degree. Since the B.A. requires a foreign language, it appeals to prospective candidates for graduate school where reading knowledge of foreign languages is necessary; the B.S. is designed for students desiring greater specialization in history and a social science orientation.

Candidates for both degrees are required to take the surveys in Western Civilization and American History, and The Historian's Craft, which focuses on methods, problems, and philosophies of historians. Beyond the basic courses are a wide range of offerings covering the political, economic, social, and cultural history of man in diverse times and places.

### *A View of the Major*

To assure a broad program of study, the College of Liberal Arts requires that students choose courses offered by departments outside the area of the major. At Northeastern University, history is classified as a social science; so History majors must complete 40 quarter hours of work in the humanities and science/mathematics (see page 109). Sixty quarter hours of history are required for the B.A. degree; 72 quarter hours for the B.S. degree.

The history requirements are broken into groups: Group A (Ancient, Medieval, and Early Modern Europe); Group B (Modern Europe); Group C (British North American Colonies and the United States); and Group D (Other Areas or Regions). A minimum of two courses (eight quarter hours) must be elected from each group.

Majors are also urged to avoid overspecialization at the undergraduate level. Though there are no maximum limits on the amount of history that may be taken, the Department advises broad course selection as the best policy for its majors. All majors are assigned to departmental advisers who offer counsel about the program. Students are urged to seek advice about history electives, about other electives, and about the Honors program.

All qualified History majors are urged to consider the Honors Program in History. Those accepted write honors theses under the direction of members of the Department. Students ordinarily register for honors courses in their last three quarters of enrollment, except for the summer quarter when honors courses are not usually offered.

## JOURNALISM DEPARTMENT

George A. Speers, M.Ed., M.S., *Associate Professor and Chairman*

### FACULTY

#### Assistant Professors

Caroline I. Ackerman, M.S.  
William Kirtz, M.S.

#### Lecturer

Bob Eddy, M.A.

#### Instructors

Joseph Levine, J.D.  
Robert B. Ruttenberg, A.B.

### Professional Preparation

#### Aims

In this modern world, it is evident that society relies increasingly on the mass media so that citizens may keep abreast of rapidly changing conditions all around them. It is the role of the journalist to observe, understand, analyze, explain, report, and interpret, as well as to provide leadership in ideas and information through the mass media's many outlets.

#### Description of Major

Many opportunities exist in the broad field of journalism. A Journalism major would be qualified for openings with daily and weekly newspapers, news departments of radio and television stations, news bureaus, wire services, general and specialized magazines, industrial journalism, public relations, publicity, and many other fields not directly related to mass media. A journalism education actually provides an excellent background for many nonmedia fields where the communications process is important.

#### A View of the Major

A journalist should have a broad background of liberal arts courses on the undergraduate level, and most university journalism programs have long recognized this need. The student should have some background and professional courses, but not to the point of overspecialization.

The generally accepted formula in Journalism for the bachelor's degree is a combination of approximately 75 percent liberal arts courses and 25 percent professional courses. This combination is preferred by most graduate schools of journalism, as well as leaders in the field.

In the freshman year at Northeastern, all courses are in the liberal arts. In each of the upper-class years the ideal arrangement is to take one journalism course each quarter, and in some quarters two, with three liberal arts courses in the humanities, social sciences, sciences, and mathematics.

Because journalism skills can be better expanded and understood with the aid of a laboratory, upper-class Journalism majors are encouraged to participate in the Cooperative Plan of Education. Co-op jobs with newspapers, radio and television stations, news bureaus, and public relations offices provide a laboratory experience. This is quite important to one who wishes to be part of the world of communications. In addition, such experience gives a student a major advan-



tage if he or she decides to seek admission to a graduate program in journalism.

Journalism majors enrolled in the B.A. program will take eight quarter hours in each of the following: U.S. History, other history electives, English literature, English electives, political science, and economics. General electives of approximately 40 quarter hours or ten courses are also required. (See page 109 for distribution and foreign language requirements.) Thirty-two quarter hours are required in the Fundamentals of Newswriting, Techniques of Journalism, History of the Principles of Journalism, and Press and Society.

Students selecting the B.S. program will also take the aforementioned courses but must include 24 quarter hours in mathematics, physics, biology, or other science courses. In this case, there is no foreign language requirement.

## **MATHEMATICS DEPARTMENT**

Maurice E. Gilmore, Ph.D., *Associate Professor and Chairman*

### **FACULTY**

#### **Professors**

Bohumil CenkI, Sc.D.  
David I. Epstein, Ph.D.  
Holland C. Filgo, Ph.D.  
Arshag B. Hajian, Ph.D.  
Robert D. Klein, M.S.  
Flavio B. Reis, Ph.D.  
Gabriel Stolzenberg, Ph.D.  
Harold L. Stubbs, Ph.D.,  
Robert G. Stone Professor  
of Mathematics  
Jack Warga, Ph.D.

#### **Associate Professors**

Roger M. Antoine, M.A.  
Shirley A. Blackett, M.Ed.  
Samuel J. Blank, Ph.D.  
Mark Bridger, Ph.D.  
Bruce Claflin, M.S.  
Ellen H. Dunlap, B.A.  
John Frampton, Ph.D.  
Alberto P. Galmarino, Ph.D.  
Samuel M. Giveen, M.A.  
Eugene Gover, Ph.D.  
Nancy Kopell, Ph.D.  
Richard A. Rasala, Ph.D.  
Thomas O. Sherman, Ph.D.  
Victor R. Staknis, Ph.D.  
Betty Stark, Ph.D.

#### **Assistant Professors**

Gail A. Carpenter, Ph.D.  
Daniel I. A. Cohen, Ph.D.  
Harriet Fell, Ph.D.  
Lev R. Ginzburg, Ph.D.  
Nishan Krikorian, Ph.D.  
Michael Perloff, M.S.  
Richard D. Porter, Ph.D.  
Jayant Shah, Ph.D.  
Brian Smith, Ph.D.

#### **Instructor**

John Casey, B.A.

### **Professional Preparation**

#### *Aims*

The Department aims to develop and expand the abilities of students interested in this exact science, one of the oldest and most basic of all the sciences.

*Description of Major*

The Department offers two programs of studies in mathematics. One leads to a degree of Bachelor of Arts and requires a minimum of eleven mathematics courses. The foreign languages recommended are French, German, Italian, or Russian since there is more writing related to mathematics in these languages than in the others offered. The other program leads to a degree of Bachelor of Science and requires a minimum of fourteen mathematics courses but does not require the study of a foreign language.

*A View of the Major*

All students must take a basic sequence of mathematics courses, and as a rule, it should be completed by the end of the sophomore year. It provides a working knowledge of the calculus of one and several variables, differential equations, some linear algebra, and numerical methods. With respect to the latter, while a computer programming course is not required, students will be encouraged, and eventually, expected to acquire the basic programming skills necessary for numerical solution of complex problems. An elementary programming course is available for this purpose.

**Directed Study**

For highly motivated students, a freshman-sophomore directed study program (beginning in the winter of the freshman year) runs concurrently with the calculus sequence and provides an informal setting for independent research and intensive discussion of mathematical concepts and theories. Students interested in such a program should consult their calculus instructor.

Courses of directed study are also available for more advanced students. A transition from the basic sequence to more advanced parts of the curriculum is provided by Analysis I-II and Advanced Linear Algebra I. These courses are prerequisites for many advanced courses in applied analysis, complex analysis, topology, and foundations.

As a rule, students planning to take a substantial number of mathematics courses (e.g., two per quarter) should take these courses in the middler year. Students may wish to take a prerequisite for more advanced courses in algebra or one which includes linear, nonlinear, and dynamic programming, or both.

Courses in probability, statistics and numerical analysis may also be taken directly after the basic sequence.

Courses in systems programming generally require only a sufficient background in that field. Courses in computer science, such as computer organization, information structure, and compilers, generally require at least one quarter's experience in the field. More advanced training is available in some areas of computer science, such as artificial intelligence and combinatorial theory.

In the fourth and fifth years, students who have completed Analysis I-II and Advanced Linear Algebra I will have a variety of mathematics electives from which to choose. Some will wish to concentrate in one area such as algebra, analysis, topology, or applied mathematics, while others may prefer a more diversified program. Many of the upper-level courses, such as probability and complex analysis, reside in the common ground of "pure" and "applied" mathematics. Others, such as algebra and numerical analysis, are more specialized.

Students may wish to work out with their adviser a program of directed study and/or take first- and second-year graduate courses and seminars.

## MODERN LANGUAGES DEPARTMENT

Holbrook Robinson, *Assistant Professor and Acting Chairman*

### FACULTY

#### Professors

Louis Cooperstein, M.A.  
Samuel Jaramillo, Ph.D.

#### Associate Professors

Israel Aluf, Ph.D.  
Nazzareno F. Cedrone, Ph.D.  
Benedetto Fabrizi, D.M.L.  
Juliette Gilman, Ph.D.  
Charles E. Kitchin, M.A.  
Philip H. Stephan, Ph.D.  
Edward B. Williams, Ph.D.

#### Assistant Professors

Lillian Bulwa, Ph.D.  
Bonnie McSorley, Ph.D.  
Robert B. Modee, M.A.  
Constance Rose, Ph.D.  
John Spiegel, M.A.  
Maryanne Vetterling, Ph.D.

#### Instructors

Elizabeth Boehme, Ph.D.  
Anthony Ford, M.A.  
Anita D. Licis, M.A.

### Professional Preparation

#### *Aims*

The study of Modern Languages can be of value to all students, regardless of their major field of interest. In the complex and rapid pace of modern life, there is a need for increased communication between varied and often divergent cultures, even those within the narrow confines of one's own community. To better understand and appreciate these cultures, it is very important to know the way in which the members of the culture think.

As the principal means of communication, language frequently offers the key to understanding. Thus language study may serve to help one achieve a more cosmopolitan, open-minded, and sensitive view of the world.

The Department offers background preparation for students interested in elementary, secondary school, or college teaching, international business relations, government service, journalism, library science, world affairs, travel, and more recently, community service (especially in Spanish-speaking areas).

The major in Modern Languages requires advanced courses in two languages and is available in French, German, Italian, Russian, or Spanish. Those who wish to teach in college must plan on graduate study.

#### *Description of Major*

The freshman year is normally considered a year for general background. It will establish the foundation upon which the major will be formed. It is a year which should be utilized to fulfill as many general requirements as possible so that during the upper-class

years more time can be devoted to the major discipline.

Normally the study of the minor language would begin in the second year. However, in exceptional cases, this pattern may be altered to permit a student to begin his second language in the freshman year, or perhaps, postpone it to a later year. The Modern Language major should plan to take at least two language electives per quarter from the beginning of the second year. Again, of course, this pattern may be varied to fit the needs of the individual student.

It should be noted that the requirements indicated here for the major and minor languages are *minimum* requirements. When at all possible, a student is strongly encouraged to go beyond them, and even, perhaps, to pursue a third language.

#### *A View of the Major*

The Department offers a choice of either a Bachelor of Arts or a Bachelor of Science degree. In each case, the student is offered a choice of French, German, Italian, Russian, or Spanish. One of these languages will be selected as the major language, with a second as the minor. Both degrees require Freshman English.

The B.A. is, of course, the traditional degree for this discipline. A candidate for the B.A. must satisfy the college distribution requirements for graduation and, in addition, must meet the departmental requirements in his major. These requirements are: eight quarter hours in Western Civilization; eight additional quarter hours in history (any other history courses relevant to the major are acceptable); eight quarter hours of Survey of English Literature; a minimum of 32 quarter hours of advanced work in the major language and eight quarter hours of advanced work in the minor language. Advanced work may be defined as any course beyond the intermediate level of the language.

The Bachelor of Science degree in Modern Languages differs from the B.A. primarily in its emphasis. Whereas the B.A. requires that the student satisfy the distribution requirements of the College of Liberal Arts, the B.S. waives these requirements in favor of a much more concentrated program in the major area. Western Civilization, however, is still a required course.

In addition, the candidate must complete eight quarter hours of Composition and Conversation in the major language and eight quarter hours of Composition and Conversation in the minor language. He/she then must complete 40 additional quarter hours of advanced work in the major language and 16 additional quarter credits of advanced work in the minor.

#### *Additional Information*

In the basic language courses, attendance in the language laboratory is required for two half-hour sessions per week. The facilities of the language laboratory are also available on an optional basis for advanced work.

## **PHILOSOPHY AND RELIGION DEPARTMENT**

Stephen L. Nathanson, Ph.D., *Associate Professor and Chairman*

### **FACULTY**

#### **Professors**

Walter L. Fogg, Ph.D.  
Pavel Kovaly, Ph.D.

#### **Assistant Professor**

Michael R. Lipton, Ph.D.

#### **Associate Professors**

William J. DeAngelis, Ph.D.  
Edward A. Hacker, Ph.D.  
Stephen L. Nathanson, Ph.D.  
Gordon E. Pruett, Ph.D.  
Joseph H. Wellbank, Ph.D.

## **PHILOSOPHY**

### **Professional Preparation**

#### *Aims*

Philosophy deals with a wide range of questions and issues which have been generated by various aspects of human experience, by the beliefs and theories people hold, and by the practical problems human beings confront. Philosophy includes both questions and theories related to art, religion, morality, society, and natural and social sciences. Because of the breadth of its concerns, the study of philosophy provides a unique opportunity for students to examine and improve their beliefs in many areas through critical reflection.

Through readings, discussion, and writing, philosophy students encounter and examine questions concerning the nature and validity of religious beliefs, moral judgments, and scientific theories. Particular questions of values and social policy from areas such as law, medicine, and technology are dealt with critically and carefully. Through analysis of issues and evaluation of arguments, philosophical study can help students to reach an understanding of diverse sorts of knowledge and areas of controversy.

The program includes courses that strengthen the student's work in other areas and provide an understanding of the methods and traditions of philosophical and religious thought. Many select philosophy as a major to develop a broad background in the humanities or sharpen their critical abilities for graduate study not only in philosophy or religion, but also in law, history, political science, education, or literature. Indeed, former Philosophy majors can be found in most types of professional careers.

The student of religion seeks to understand man's religious experience both as individual response and within its social, historical, literary, and political context. Religions (Christian, Jewish, Hindu, etc.) are studied as well as the mythical and mystical dimensions of religious experience. The program strives to make clear the relationship between the religious experience and the other facets of human life with which the liberal arts are concerned. Courses are offered at introductory and intermediate levels. Although the program in religion does not offer a major, it does provide a comprehensive introduction to religious studies.

*Description of Major*

Northeastern's program for a Philosophy major is designed to provide a balanced understanding of the nature of philosophy and particular philosophical problems which arise in the various arts and sciences. A maximum number of electives has been provided so that a student may choose in accordance with his own background and interests. Students may pursue either a five-year co-op or a four-year, full-time course of study.

Although the Departmental requirements for the B.A. degree are the same as those for the B.S., those students taking the B.A. must meet the language and distribution requirements set by the College. All degree candidates in Philosophy must take at least eight quarter hours in English and 52 quarter hours in the Department, and must meet the following specific requirements: Classical Greek Philosophy and Modern Philosophy; Introduction to Logic or Symbolic Logic (the Department emphatically recommends that students contemplating graduate studies in Philosophy take Symbolic Logic); Theory of Knowledge or Metaphysics or Moral Philosophy; and at least one Seminar. The remaining 32 quarter hours are Philosophy electives, to be selected after consultation with the student's departmental adviser.

*Description of Minor*

To meet the needs of students majoring in other areas who have a special interest in Philosophy, the Department offers a Minor in Philosophy. The program contains the essential core of courses, as well as a great range of electives to accommodate individual interests.

To qualify for a minor in Philosophy, a student must take 28 quarter hours in the field. These will be distributed as follows:

- A. Introductory courses: Introduction to Philosophy I or Introduction to Philosophy II or Introduction to Scientific Method;
- B. History of Philosophy: Classical Greek Philosophy or Modern Philosophy;
- C. Logic: Introduction to Logic or Symbolic Logic;
- D. Electives: Any four courses in Philosophy of an advanced nature, i.e., any course numbered over 26.110.



## PHYSICS DEPARTMENT

Roy Weinstein, Ph.D., *Professor and Chairman*

### FACULTY Professors

Ronald Aaron, Ph.D.  
Petros N. Argyres, Ph.D.  
Richard L. Arnowitt, Ph.D.  
Alan H. Cromer, Ph.D.  
Marvin H. Friedman, Ph.D.  
David A. Garelick, Ph.D.  
Marvin W. Gettner, Ph.D.  
Michael J. Glaubman, Ph.D.  
Hyman Goldberg, Ph.D.  
Bernard Gottschalk, Ph.D.  
Walter Hauser, Ph.D.  
Giovannin Lanza, Ph.D.  
Bertram J. Malenka, Ph.D.  
Pran Nath, Ph.D.  
Clive H. Perry, Ph.D.  
Eugene J. Saletan, Ph.D.  
Carl A. Shiffman, Ph.D.  
Yogi N. Srivastava, Ph.D.  
Michael T. Vaughn, Ph.D.  
Eberhard von Goeler, Ph.D.  
Thomas H. Wallace, Ph.D.  
Fa Yuch Wu, Ph.D.

### Associate Professors

Robert I. Boughton, Ph.D.  
William L. Faissler, Ph.D.  
Robert P. Lowndes, Ph.D.  
James E. Neighbor, Ph.D.  
Jeffrey B. Sokoloff, Ph.D.  
Allan Widom, Ph.D.

### Assistant Professors

Arun Bansil, Ph.D.  
David L. Johnson, Ph.D.  
Michael L. Mallary, Ph.D.  
Fernando D. Medina, Ph.D.

### Visiting Assistant Professor

Ashok Rastogi, Ph.D.

### Professional Preparation

#### *Aims*

Physics is concerned with the fundamental principles which govern natural phenomena, ranging in scale from collisions of subatomic particles through the behavior of solids and liquids, to exploding stars and colliding galaxies. From these principles, we can also understand basic chemical and biological processes, as well as the operation of engines, solid-state electronic devices, lasers, and other tools of modern civilization.

The Physics Department offers undergraduate courses at four levels:



1. Descriptive courses intended primarily for nonscience majors with limited mathematical background;
2. General survey courses intended for students in scientific and engineering fields;
3. Advanced courses which focus on particular areas of physics; intended mainly, but not exclusively, for physics majors.
4. Highly advanced courses intended mainly, but not exclusively, for graduate students in Physics.

### *Description of Major*

Students who major in physics will have a wide variety of careers open to them. In addition to work in industrial or government laboratories in areas of applied physics, there are opportunities in allied fields such as biophysics, meteorology, oceanography, and the various branches of engineering. In such fields, and when new fields develop, the physicist is frequently at an advantage because of the emphasis on fundamental principles in a physics education.

A background in physics is also increasingly useful for those who wish to enter medicine, the law, or business.

A student majoring in physics can follow either a four-year, full-time program or a five-year, co-op program. Co-op jobs are available in many of the above fields, both in the Boston area and elsewhere.

Many graduates have gone on to earn advanced degrees in physics and related fields.

### *A View of the Major*

Physics majors may study for either the Bachelor of Arts or Bachelor of Science degree.

Candidates for the B.A. are required to pass three lecture courses and three laboratory courses in physics, and one course in mathematics, beyond the basic survey courses in physics and mathematics of the first two years. The College requirements in English, modern language, humanities, and social science must also be satisfied. This program is extremely flexible and allows the B.A. physics major to pursue other interests in depth.

Candidates for the B.S. must pass seven lecture courses and three laboratory courses in physics, two advanced courses in mathematics and five technical electives (courses in science or engineering) beyond the basic physics and mathematics courses. The B.S. program is appropriate for those students who wish to pursue graduate study in Physics.

The first-year program of all Physics majors includes a three-quarter physics course common to all science and math majors, and a three-quarter mathematics course. The remaining two courses each quarter can be chosen from a wide range of electives. Two-quarter courses in physics and mathematics and a physics laboratory course in Electronics and Data Analysis are required in the second year.

The upper-class lecture courses offered by the Department include Mechanics, Wave Motion and Optics, Thermodynamics, Electromagnetic Theory, Quantum Theory, Mathematical Physics, Nuclear Physics, Solid State Physics and Astrophysics. The upperclass laboratories include Wave Motion, Modern Physics, and Advanced Laboratory. These courses are taught by active researchers in Physics who have a strong commitment to teaching, and the classes are generally small (10-15 students).

There are special lectures for students sponsored by the Society of Physics Students, and the Physics Club, and reading courses on special topics in physics of interest to particular students.

Students interested in majoring in Physics should consult with one of the advisers in the Department as early as possible in their college careers to plan programs.

*Honors Program and  
Undergraduate Research*

Students invited into the Honors Program may take graduate courses, reading courses, and special topics courses in the various research fields of the Department. Such work occasionally leads to presentation by the students of papers at professional meetings and to publication in journals.

## **POLITICAL SCIENCE DEPARTMENT**

David E. Schmitt, Ph.D., *Professor of Political Science and Acting  
Chairman*

**FACULTY Professors**

Robert L. Cord, Ph.D.  
Walter S. Jones, Ph.D.  
R. Gregg Wilfong, Ph.D.

**Associate Professors**

L. Gerald Bursey, Ph.D.  
Robert E. Gilbert, Ph.D.  
Minton F. Goldman, Ph.D.  
Steve Worth, Ph.D.

**Assistant Professors**

Duane L. Grimes, M.A.  
Seth I. Hirshorn, Ph.D.  
Edward M. Humberger, Ph.D.  
Eileen McDonagh, Ph.D.  
Suzanne Ogden, Ph.D.

### **Professional Preparation**

*Aims*

Political science is concerned with the study of political institutions, the social and economic forces which shape them, the cultural context within which they operate, and with human behavior in political matters.

The Department of Political Science at Northeastern University has three objectives: (1) to educate within the framework of the best liberal arts tradition; (2) to heighten a student's awareness of political forces in the environment, and to sharpen his or her perception of a student's role as a citizen in a democratic society; and (3) to provide a solid academic foundation for those who elect political science, law, or public administration as a professional career.

*Description of Major*

For all students, the study of political science can be the gateway to a liberal education with its benefits of broadened interests, sharpened

sensibilities, and a quickened sense of civic responsibility. If one has a special interest in politics, studies in this field provide excellent preparation for governmental services, the study of law, the teaching of government and related subjects, or for a career in politics or public management.

For the student who wishes to pursue his/her professional studies at the graduate level, concentration in Political Science opens up many attractive opportunities. There are career opportunities in public management at the federal, state, or local government level while positions in research are available in government and university research bureaus. Teaching offers further career possibilities. The growth of specialized agencies in international bodies like the United Nations calls for the skills of the political scientist. Individuals with specialized training in political science are in demand also in some less obvious areas: in the public service programming of educational and commercial television, in journalism, and in legislative study and public relations activities with private associations.

The Department will give assistance as professional objectives are planned and will help to alert the student to professional opportunities and the means for taking the greatest advantage of them.

#### *A View of the Major*

A student may elect either the B.A. or the B.S. degree program. If he elects the B.A. program, he will have to meet the foreign language and distribution requirements of the College. If he elects the B.S., he will be required to take courses in quantitative analytical methods. However, either degree requires the following courses: eight quarter hours of Introduction to Political Science; four quarter hours each of the following: Conceptual Foundations of Political Analysis, Foreign Governments, International Relations, Public Administration, and Political Theory; 20 to 24 quarter hours of electives in Political Science, six electives (24 quarter hours) in the social sciences, with one course in at least three of the following: anthropology, economics, history, psychology, or sociology. The B.S. student is required to take four quarter hours each in Scope and Methods of Political Science, Quantitative Methods, and a Research Seminar. Courses in basic math and FORTRAN and FORGO are also recommended for B.S. students.

The B.S. program with a concentration in public administration provides a third option for the student. This program requires the completion of 40 hours of required courses in Introductory Political Science, American Government, Public Administration, Public Management, Personnel Administration, Quantitative Methods, and the use of computers. The student may also undertake a directed study project based on a cooperative work experience in a government agency. In addition, he must complete 24 hours of electives in the social sciences, at least eight of which should be Economics.

## PSYCHOLOGY DEPARTMENT

Harlan Lane, Ph.D., Doc. es Lettres, *Professor and Chairman*

### FACULTY

#### Professors

John C. Armington, Ph.D.  
Helen S. Mahut, Ph.D.  
Bertram Scharf, Ph.D.  
Murray Sidman, Ph.D.  
Michael Terman, Ph.D.  
Harold S. Zamansky, Ph.D.

#### Associate Professors

Edward A. Arees, Ph.D.  
Roger Brightbill, Ph.D.  
Perrin S. Cohen, Ph.D.  
Charles Karis, Ph.D.  
Harry Mackay, Ph.D.  
Alexander A. Skavenski, Ph.D.  
Lawrence Stoddard, Ph.D.

#### Assistant Professors

Martin Block, Ph.D.  
Karen Geelen, Ph.D.  
Joanne Miller, Ph.D.  
Claude Sigel, Ph.D.

#### Senior Research Associates

Robbin Battison, Ph.D.  
Leila R. Cohen, Ph.D.  
François Grosjean, Ph.D.  
Juan S. Terman, Ph.D.  
Stuart M. Zola, Ph.D.



### Professional Preparation *Aims*

The undergraduate curriculum at Northeastern has been carefully designed to introduce students to the scientific underpinnings of modern psychology and enable a sophisticated choice among opportunities for advanced work.

The field of psychology, broadly defined as the science of behavior, has grown so rapidly that students aiming for careers in the field must almost always anticipate advanced study in specialized areas beyond the bachelor's degree. The diversity of academic and professional activities which we label "psychology" today may be seen in the following sampling of divisions of the American Psychological Association: *teaching, experimental, evaluation and measurement, physiological and comparative, developmental, personality and social, social issues, arts, clinical, consulting, industrial, educational, school, counseling, public service, military, adult development and aging, engineering, disability, consumer, philosophical, experimental*

*analysis of behavior, history, community, psychopharmacology, psychotherapy, hypnosis.* Thus, undergraduates preparing to be psychologists, or those who just want to learn more about the field, have set quite a goal for themselves!

### *Description of Major*

Our courses are not merely aimed at preparing students for advanced training. They also reflect the personal and social concerns of today's undergraduates. For example, psychology has recently produced a new and powerful understanding of the way environmental and physiological factors affect man's behavior. It has developed a technology whose methods have already profoundly transformed both individuals and society.

How do we evaluate this science and its technology? How do we ensure that researchers in psychology are free to investigate fully, and that the technology is applied humanely to create a better life for all people?

These are only a few of the questions Northeastern undergraduates will be asking as they progress through a newly designed curriculum which gives opportunities for laboratory practice and experimentation, field experiences in behavior technology, and small-group seminars to encourage critical and creative evaluation of psychology's accomplishments and its future.

Psychology explores many topics such as the function of the brain in determining behavior; how we see, hear, and learn; what behavioral science can offer in the problem areas of mental retardation, personality problems, infancy and old age; how we might suggest social changes based on laboratory data to increase men and women's accomplishments and satisfactions in the modern world.

### *A View of the Major*

Since modern psychology is multidisciplinary, both B.A. and B.S. programs include distribution requirements in allied sciences to fulfill the need for wide exposure to varying techniques of scientific practice and interpretation. The sequence of elementary courses in the Department relies heavily on the personalized system of instruction, which allows students to progress at their own pace. Thus, the Northeastern Psychology program has a flavor of "independent study" about it, beginning as early as the freshman year. Students find this system flexible in terms of their needs and interests, as well as an intellectual challenge which requires a commitment to study mastery of course material.

The Bachelor of Science program is usually recommended for students with a strong scientific or professional interest, who may ultimately consider applying to graduate schools in psychology, medicine, or environmental science. Final choice of the B.A. or B.S. should be made only after a personal consultation with a Psychology faculty adviser. B.A. candidates must complete at least 16 quarter hours of math and/or science courses (biology, chemistry, or physics); B.S. candidates, 24 quarter hours, including Physics for Psychology I and II. Lab courses are recommended; courses geared specifically to humanities students are not. With B.S. students, the faculty recommends taking both a math and science sequence in the freshman year. The choice of Fundamentals of Math or Calculus depends on a student's readiness to enter a course with calculus content.

Foundations of Psychology I & II are part of a special group of "self-paced" psychology courses. Students receive a carefully structured

sequence of study units, frequent progress evaluations, one-to-one tutorials, and optional small-group discussions. We call this group of courses a personalized system, since: (a) study is at a flexible pace which best fits students' needs; (b) individual tutorial assistance for any study problem is available, even if it is unique to one student; and (c) the assignments are structured to help achieve mastery of the course material so that every student can aim for the grade of A.

Students who receive the grade of A in a self-paced course may apply for a Teaching Practicum for elective credit in which they learn how to give tutorials and solve study problems for the benefit of other students in a course they themselves have mastered. Many students consider this opportunity an invaluable adjunct to standard course experiences. Their own study habits improve as a result, they delve more deeply into course content, they become more sophisticated as psychologists, and they come to the view that a goal for students in a modern university includes the sharing and transmission of knowledge among peers. The Practicum includes a series of seminar discussions on teaching problems and techniques.

Advanced undergraduate courses common to both degrees are Learning & Motivation, Perception, Physiological Basis of Psychology I, Personality, and the Psychology of Language. Students may choose laboratory courses in Psychology from the following list: Experimental Personality, Cognition Laboratory, Sensation and Perception Laboratory, Learning Laboratory, Applied Behavior Modification (at the Walter E. Fernald State School in Waltham), Practicum in Physiological Psychology, and Psychology of Language Laboratory. In addition, qualified students may participate in the Department's Directed Studies Program where, under the direction of a faculty member, students engage in the ongoing research projects in the various laboratories of the Department.

Freshmen are invited to attend the Freshman Roundtable offered each quarter. Every week, a different faculty member speaks about his current research specialty and conducts a laboratory visit. In the past, students have found this experience to be both interesting and informative. They have also said that it has helped them choose their field of study.

Classroom learning and tutorial instruction are complemented by laboratory research in the Psychology Department, where the student can learn by doing.

### Research Laboratories

The student who enrolls in laboratory courses and directed study courses will take advantage of the Department's resources for research which include: (a) in the field of learning, behavior laboratories for research with humans, monkeys, rats, and pigeons; and, in collaboration with the Walter E. Fernald State School, an instructional setting for research and training in behavior modification with retarded children and adults; (b) in neuropsychology and ethology, primate and rodent surgeries in neuroanatomical and histological laboratories, with apparatus for stimulating and recording activities of the brain; (c) in the psychology of vision and hearing, specialized enclosures and equipment for presenting visual and auditory stimuli and for measuring responses of the eye and the ear, including on-line computers; (d) in language and cognition, audio and video recording facilities and a computer for control of stimulus and response variables; and (e) in the field of personality, darkrooms, tachistoscopes and an eye-movement camera.



## SOCIOLOGY AND ANTHROPOLOGY DEPARTMENT

Ronald J. McAllister, Ph.D., *Associate Professor and Chairman*

### FACULTY

#### Professors

Morris Freilich, Ph.D.  
Blanche Geer, Ph.D.  
Elliott A. Krause, Ph.D.  
Frank F. Lee, Ph.D.  
Morton Rubin, Ph.D.  
Earl Rubington, Ph.D.

#### Associate Professors

Patricia Golden, Ph.D.  
Lila Leibowitz, Ph.D.  
Jack Levin, Ph.D.  
Carol A. Owen, Ph.D.

#### Assistant Professors

Arnold Arluke, Ph.D.  
Richard Bourne, Ph.D.  
Marcia Bystry, Ph.D.  
Deborah David, Ph.D.  
C. Paul Dredge, Ph.D.  
William N. Greenbaum, Ed.D.  
Freddie Hill, Ph.D.  
Wilfred Holton, Ph.D.  
Debra Kaufman, Ph.D.  
Thomas Koenig, Ph.D.  
Marlene MacLeish, Ed.D.  
John Smetanka, Ph.D.

### Professional Preparation

#### *Aims*

The Department seeks a better understanding of the societies and social arrangements in which human beings live and die: how societies function and change, and how individuals, groups, and institutions interact.

#### *Description of Major*

A major in this Department provides a background for a wide spectrum of careers in public or private service, as well as specific preprofessional training.

Students may concentrate in sociology and anthropology, or both. Students who wish to do both must design a program of their own with the help of an adviser. Those enrolled in premedical, prelegal, paramedical and a variety of other preprofessional programs should find that sociology and anthropology courses provide a useful background.

#### *A View of the Major*

Majors may follow either a four-year program or the five-year cooperative course of study. Cooperative work assignments vary from placement in mental hospitals and social agencies to placement in university, government, and other research and policy-making settings. Transfers between the four-year and the five-year program should go smoothly, and registration in either is not an irreversible decision.

The department offers both a Bachelor of Arts and a Bachelor of Science degree. The requirements for each degree, both in sociology and in anthropology, are outlined below. A student with special educational goals may, of course, take more departmental electives than are required. A strong background in sociology-anthropology can be beneficial in a number of applied areas. B.A. students may wish to look at the concentration requirements for B.S. students and consult their advisers for assistance in planning programs with specialized goals.

The Department offers a B.S. with concentrations in Anthropology or Sociology. Students electing this option must fulfill all of the departmental requirements for the B.A. degree, and must take a coherent program involving additional course work as outlined below. Specializations either involve more intensive study within a concentration or are interdisciplinary.



## ANTHROPOLOGY

B.A. students in Anthropology must take at least 48 quarter hours in departmental courses, including 40 in Anthropology and eight in Sociology. The exact distribution can be arranged. Minimum requirements are as follows:

- A. Preparatory—Introduction to Anthropology and Introduction to Sociology. (Prospective majors with equivalent background may be exempted. A student should consult a departmental adviser.)
- B. Core Requirements—at least three of the following, as available: Language and Culture; Individual and Culture; Human Origins; Myth and Religion; Sex, Sex Roles, and Family; Culture in Transition; Tribal Societies and Culture; and Peasant Society and Culture.
- C. Electives—Students must take at least six additional electives in Anthropology and at least one additional in Sociology. Qualified students are encouraged to take relevant graduate courses with the consent of the instructor. Majors should consult their advisers freely since courses elsewhere in the University may round out a special interest or focus.
- D. Nondepartmental Requirements—Six courses from the following social sciences: African-American Studies, Economics, History, Political Science, and Psychology.

B.S. students in Anthropology take the same basic core of courses and, in addition, an individually designed specialization in an area of interest consisting of at least five courses. A student *must* confer with an adviser who will help develop such a program, place it on record, and supervise it. Interdepartmental and interdisciplinary specializations can be arranged in such areas as linguistics, Native American Studies, biological anthropology, psychological anthropology, or area studies focusing on Latin America, Africa, Asia, and the Middle East.



## SOCIOLOGY

B.A. students in Sociology must take at least 52 quarter hours in departmental courses, including 44 in Sociology and eight in Anthropology, and must meet the following minimum requirements:

- A. Preparatory—Introduction to Anthropology and Introduction to Sociology. (Prospective majors with equivalent background may be exempted. A student should check with the Department.)
- B. Core Requirements—Statistical Analysis; Research Methods I; Research Methods II; Social Theory I; Social Theory II; Class, Power, and Social Change.
- C. Electives—The following are minimum requirements: two intermediate courses (at 100 level); two advanced courses (at 200 level); and one intermediate or advanced Anthropology course. With the consent of the adviser, qualified students are encouraged to take certain graduate and directed study courses and/or the Senior Majors Seminar.
- D. Nondepartmental Requirements—Six courses from the following social sciences: African-American Studies, Economics, History, Political Science, and Psychology.

B.S. students in Sociology take the same basic core of courses and, in addition, an individually designed specialization in an area of interest consisting of at least six courses, three from within and three outside the department. A student *must* confer with an adviser who will help develop such a program, place it on record, and supervise it. Specializations can be arranged focusing on social welfare, health services, political studies, urban studies, education and society, ethnic studies, and organizational studies. There are, of course, many other areas of specialization and possible combinations of courses. Following are a few examples. (Courses in the Department of Sociology/Anthropology are indicated by an asterisk.):

#### SOCIAL WELFARE

- \*Sociology of Poverty
- \*Social Policy and Social Intervention
- \*Human Services Organization
- \*Sociological Issues in Welfare
- Social Welfare Problems
- Politics of Poverty
- Poverty and Discrimination

#### HEALTH SERVICES

- \*Medical Sociology
- \*Death and Dying
- \*Health Care as a Social Issue
- \*Culture and Mental Illness
- Medical Economics
- Community Medicine and the Delivery of Health Care
- Human Services Administration

#### URBAN STUDIES

- \*Urban Society
- \*Community Analysis
- \*Seminar in Urban Studies
- Urban and Metropolitan Government
- Urban Economics
- Urban Geography
- American Urban History

#### LAW AND SOCIETY

- \*Crime, Conflict, and Justice
- \*Sociological Theories of Crime
- \*Social Policy and Social Intervention
- Civil Liberties
- Law and Society
- ✓ The Economics of Crime
- The Politics of the Criminal Justice System

#### SEX ROLES AND FAMILY

- \*Sex, Sex Roles, and Family
- \*Sociology of the Family
- \*Kinship and Society
- \*Changing Sex Roles
- Sex Roles in American Politics
- Women in History
- Politics of the Black Family

## ORGANIZATIONAL STUDIES

- \*Sociology of Business and Industry
- \*Administration and Formal Organization
- \*Social Policy and Social Intervention
- \*Human Services Organization
- Organization Theory I
- Industrial Organization and Public Policy
- People in Organizations

*\*These are just samples of approaches to these particular areas; there are many other possible combinations of courses. There are many other areas of specialization.*

## MUSIC DEPARTMENT

Roland Nadeau, M.M., *Professor and Chairman*

### FACULTY

#### Professors

Herbert Silverman, Ed.D.  
Leo Snyder, M.M.  
William Tesson, M.M.

#### Assistant Professor

Joshua Jacobson, M.M.

#### Lecturer

James R. Mitchell, M.A.

#### Associate Professors

Reginald Haché, A.D.  
Robin M. Hendrich, L.R.A.M.  
Helen Keaney, M.M.  
David Sonnenschein, D.M.A.

### *Aims*

The Department of Music offers a comprehensive number of courses for students with an interest in or desire to learn about music. The Department serves the musical and cultural needs of the University and its various Colleges. It aims to provide a wide range of musical experiences for students and the University community with emphasis on the aesthetic aspects of intelligent listening to and learning about our musical heritage.

Department of Music courses fall within several categories: Basic Music Theory, Historical Periods and National Styles, Individual Composers and Their Music, The Forms of Music, and Basic Appreciation (overview).

In addition, faculty direct student performance organizations, such as, the Early Music Players, the N.U. Choral Society, the N.U. Symphony Orchestra, and the N.U. Bands.

Students from these performance groups, the music faculty, and artists from the community at large participate in a program of over 60 concerts per year. Most of these concerts are free and open to the public.

## College of Nursing

Juanita O. Long, R.N., M.S.N., C.A.G.S., *Dean*

Mary E. Gonyow, R.N., M.A., *Assistant Dean*

### FACULTY

#### Associate Professors

Jane Aroian, R.N., M.S.N.  
Olivia M. Breton, R.N., M.Ed.  
Janet Carroll, R.N., M.S.  
Ellen T. Daly, R.N., M.S.N.  
Flora M. DeScenza, R.N., M.S.  
Jean P. Gilbert, R.N., M.S.N.  
O. Barbara Goodfellow, R.N., M.S.N.  
Marjorie P. Johns, R.N., M.S.  
Mary P. A. Kane, R.N., M.S.N.  
Mary C. Keaney, R.N., M.S.N.  
M. Paula Kelley, R.N., M.S.  
Jane M. Lee, R.N., M.S.N.  
M. Marcia Lynch, R.N., M.S.  
Susan C. Marchessault, R.N., M.S.  
Marilyn M. Smith, R.N., M.S., M.B.A.  
Joyce E. Tingle, R.N., M.S.  
Nancy Walden, R.N., M.S.  
Mary Wilcox, R.N., M.S.  
M. Delaine Williamson, R.D., M.S.

#### Instructors

Sister Marie Bransfield, R.N., M.S.  
Sally Cloutterbuck, R.N., M.S.  
Virginia Dooley, R.N., M.S.  
Mary Ferguson, R.N., M.S.  
Elaine Hurley, R.N., M.S.  
Katherine Rubin, R.N., B.S.  
Patricia Williams, R.N., M.S.  
Elaine Wilson, R.N., M.S.

#### Assistant Professors

Anne Marie Brogan, R.N., M.S.  
Elaine L. Capozzoli, R.N., B.S.  
Nancy M. Carr, R.N., M.S.  
Barbara E. Carran, R.N., M.S.  
Lael T. Cutler, R.D., M.P.H.  
Patricia DeBoom, R.N., M.S.  
Kathleen Govostes, R.N., M.S.  
Barbara P. Madden, R.N., M.S.  
Edna Mayer, R.N., M.S.  
Geraldine A. Medici, R.N., M.S.N.  
Maureen Nagelhout, R.N., M.S.  
Marion O. Newton, R.N., M.S.  
D. Jeanne Otto, R.N., M.S., M.Ed.  
Alma Randall, R.N., M.S.  
Constance A. Willis, R.N., M.S.

### Professional Preparation

#### *Aims*

First in the nation to operate on the Cooperative Plan, The College of Nursing was established at Northeastern University in 1964. The College offers two distinct educational programs which prepare men and women to practice nursing.

The associate degree program, begun in 1964, is three years in length and leads to the degree of Associate in Science. Its purpose is

to prepare a beginning practitioner to give nursing care in a variety of patient-care settings.

Initiated in 1966, the baccalaureate degree program is five years in length and leads to the degree of Bachelor of Science. The program is designed to prepare beginning practitioners, but it also provides a foundation for career advancement via graduate experience and/or study in such areas as clinical nursing, administration, teaching, and research.

#### *Program for LPNs*

There is a special program for a limited number of qualified licensed practical nurses who wish to expand their educational background and become registered nurses. Those who meet the requirements during the first year are granted credit for past experience and education toward the Associate in Science degree.

#### *Programs for RNs*

The College of Nursing has instituted a program for registered nurses who wish to complete requirements for the Bachelor of Science Degree in Nursing.

The length of the program depends upon the individual's interest and ability to achieve advanced placement. Applicants whose knowledge of subject areas has been obtained through actual experience, previous educational preparation, or individual study, are encouraged to apply for credit through the advanced placement process. This opportunity is available in most of the nursing and non-nursing courses. Tests prepared by Northeastern University faculty and CLEP (College Level Examination Program) will be utilized.

#### *A View of the Nursing Programs*

In common with the other Basic Colleges at Northeastern, the College of Nursing operates on the Cooperative Plan. In addition to college instruction, each student obtains practical experience as a paid employee of one of the cooperative health agencies. The work does not carry academic credit, but it must be satisfactorily completed. During periods of employment, students have the opportunity to increase nursing skills and gain significant experience in nursing settings, as well as earn money to help defray expenses.

The College of Nursing programs offer general education courses concurrently with nursing courses to provide the learning foundation for the practice of nursing. The Nursing major is planned in sequential order and draws on the content from the physical, biological and social sciences, and from the humanities. There is no direct transfer from one program to another.

Freshmen remain on campus for three consecutive quarters of academic study, and students in succeeding years alternate periods of study at Northeastern with periods of work in participating health agencies. Under the guidance of the College of Nursing faculty, clinical experience in the care of patients is introduced in the first year of the associate degree program and in the second year of the baccalaureate degree program. Approximately 20 outstanding hospitals and health-related agencies are utilized to provide facilities for clinical laboratories.



Cooperative work placements are arranged by a nursing coordinator in accordance with agreements made by the University and a number of hospitals in the Greater Boston area and surrounding communities. The hospitals employ students from both programs and provide appropriate sequences of work experience. The cooperative work experience is a requirement for the degree, and students are expected to accept placement at any of the collaborating hospitals. Student preferences as to assignment will be given consideration in conjunction with other factors, but final decisions as to hospital assignment must rest with the nursing coordinator.

## **Graduation Requirements**

### *Degrees*

Either an Associate in Science or Bachelor of Science degree is awarded at the completion of the appropriate program. All candidates must successfully complete all the prescribed courses and periods of cooperative work. One hundred and fifteen quarter hours are required for the Associate in Science degree and 174 for the Bachelor of Science. An overall scholarship average of C in both nursing and general studies is required for graduation.

### **Graduation with Honors**

Candidates for the bachelor's degree who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group are graduated with high honors or highest honors. Students must attend the University at least six quarters to become eligible for honors at graduation.

### **Accreditation**

The programs of the College of Nursing are fully accredited by the National League for Nursing and approved by the Board of Registration in Nursing of the Commonwealth of Massachusetts.

### **Licensure**

The programs of the College of Nursing enable graduates to take the professional examinations established by the Board of Registration in Nursing of the Commonwealth of Massachusetts. Graduates take these examinations for licensure as registered nurses when they are first offered after graduation.

### **Special Requirements**

Students in the College of Nursing are required to wear the school uniform in clinical laboratory areas during academic quarters. A modification of the uniform is worn during cooperative work periods.

All students must carry malpractice insurance. Arrangements for this insurance are made by the University.

### **Sample Freshman-Year Program of Studies Associate Degree Nursing Program**

*First Quarter*  
Fundamentals of Nursing  
Chemistry  
Human Biology  
English

*Third Quarter*  
Fundamentals of Nursing  
Growth & Development II  
Physiology  
Basic Psychology

*Second Quarter*  
Fundamentals of Nursing  
Growth & Development I  
Anatomy & Physiology  
Microbiology



### Sample Freshman-Year Program of Studies

#### Associate Degree Program for Licensed Practical Nurses

##### First Quarter

Introduction to Technical Nursing  
Chemistry  
Basic Psychology  
Human Biology

##### Second Quarter

Technical Nursing  
Growth & Development I  
Anatomy and Physiology  
Abnormal Psychology  
Microbiology

##### Third Quarter

Nursing Seminar  
Growth & Development II  
Physiology  
English  
Trends in Nursing

### Sample Freshman-Year Program of Studies

#### Baccalaureate Degree Nursing Program

##### First Quarter

Biology  
Western Civilization  
English  
Nursing

##### Second Quarter

General Chemistry  
Biology  
English  
Nursing

##### Third Quarter

General Chemistry  
Anatomy  
Western Civilization  
Nursing

### Associate Degree Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Basic Psychology	4	American Political Process	4
*Chemistry	3	*Microbiology	4
*English	4	*Anatomy and Physiology	4
English	4	*Human Biology	3
**Principles of Sociology	4	*Physiology	4
		Electives	8

#### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Fundamentals of Nursing	18	**Abnormal Psychology	4
*Growth and Development I & II	8	**Maternal-Child Nursing	12
**Medical-Surgical Nursing I	11	Professional Development	1
Medical-Surgical Nursing II	7	Psychiatric Nursing	8

\*These courses are usually taken in the first year.

\*\*These courses are usually taken in the second year.

### Associate Degree for LPN's Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Basic Psychology	4	*Principles of Sociology	4
*Chemistry	4	**English	4
*Microbiology	4	**American Political Process	4
*Anatomy and Physiology	4	or	
*Human Biology	3	**U.S. to 1865	4
*Physiology	4	or	
*English	4	**U.S. since 1865	4
		**Electives	8

## II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Introduction to Technical Nursing	5	**Psychiatric Nursing	8
*Technical Nursing	2	Professional Development	1
*Growth and Development I & II	8		
*Abnormal Psychology	4		
*Nursing Seminar	3		
*Trends in Nursing	1		
**Maternal-Child Nursing and	12		
**Medical-Surgical Nursing II	7		

\*These courses are usually taken in the first year.

\*\*These courses may be taken in the summer of the first year or the second year.

### Baccalaureate Degree Basic Course Requirements

## I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Biology	8	**Fundamentals of Psychology I & II	8
*Western Civilization	8	**Social Anthropology	4
*English	8	Principles of Sociology	4
*General Chemistry	10	Social Psychology	4
*Anatomy	4	Electives (6)	24
**Microbiology	4	(includes 8 Q.H. of humanities)	
**Physiology	8		

## II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Nursing	9	Maternal-Child Nursing	9
**Nursing	10	Psychiatric-Mental Health Nursing	9
Growth & Development I & II in 3rd year	8	Public Health Nursing	9
Pharmacodynamics	3	Contemporary Nursing	9
Nursing	6		
Medical-Surgical Nursing	9		

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.



## **College of Pharmacy and Allied Health Professions**

Victor D. Warner, Ph.D., *Acting Dean*

### **FACULTY Professors**

Arnold S. Goldstein, Ph.D.  
O. James Inashima, Ph.D.  
John L. Neumeyer, Ph.D.  
Robert Raffauf, Ph.D.  
Pierre F. Smith, Ph.D.  
Elliot Spector, Ph.D.

### **Associate Professors**

Judith T. Barr, M.Ed.  
Roger W. Giese, Ph.D.  
James J. Gozzo, Ph.D.  
Suzanne B. Greenberg, M.S.  
Britta L. Karlsson, M.S.  
Albert H. Taubman, Ph.D.  
Victor D. Warner, Ph.D.

### **Assistant Professors**

Thomas Barnes, M.S.  
Jeffrey B. Blumberg, Ph.D.  
Norman R. Boisse, Ph.D.  
Gerald L. Davis, Ph.D.  
Richard C. Deth, Ph.D.  
Robert N. Hanson, Ph.D.  
Clifford E. Hotte, Ph.D.  
Bynum Jackson, Ph.D.  
Donald S. Kosersky, Ph.D.  
Simon H. Kuttub, Ph.D.  
Nancy Carolyn Love, M.S.  
Patrick F. Plunkett, M.S.  
B. Susan Rogers, M.S.  
Fred N. Schneiweiss, Pharm.D.  
Leon D. Shargel, Ph.D.  
Judith Weilerstein, M.P.H.  
Andrew B. C. Yu, Ph.D.

### **Instructors**

Victoria Gregonis, B.S.  
Mary MacKinnon, M.S.

Glen B. Miller, B.S.  
Joan Tourigney, B.S.

### **Clinical Professor**

John Webb, M.S.

### **Clinical Associate Professors**

Michael A. Davis, Sc.D.  
William A. Gouveia, M.S.  
Alun G. Jones, Ph.D.

### **Clinical Assistant Professors**

Jerome P. Janousek, M.S.  
Joseph M. Sceppa, M.S.  
Richard T. Scheife, Pharm.D.  
George P. Sesin, Pharm.D.

### **Clinical Instructors**

Martin Abramson, M.S.  
Mario Forcione, M.Sc.  
Gloria Gifford, B.S.  
Maryann Greer, B.S.  
Alan P. Kohl, B.S.  
Gail F. Lockberg, B.S.  
Louis Lunetta, M.S.  
Gaetano Paladino, M.S.  
Joseph Reynolds, B.S.  
Anthony Ricciardone, M.S.  
Marcia Stowell, B.S.  
Leon Tenofsky, M.S.  
Bruno Vignoni, B.S.

### **Adjunct Professors**

Bradley Copeland, M.D.  
George Krause, M.S.

### **Lecturers**

Howard Christian, M.D.  
Agnes Kim, M.D.

## **Professional Preparation**

### *Aims*

Northeastern University recognizes the increased demand for well-educated pharmacists and allied health professionals. The College of Pharmacy and Allied Health Professions is pledged to meet this need by combining its unique Cooperative Plan of Education with a highly innovative academic program designed to prepare students to become effective professional practitioners, to enter graduate schools, and to accept employment in the many areas responsible for the delivery of health care.

### *A View of the Five-Year Program*

Fundamental to the College's approach to health care education are:

1. A curriculum of highly relevant and closely integrated courses in the physical, biological, behavioral, and administrative sciences comprising the basis of modern professional practice;
2. A responsiveness to the individual career goals of our students and the capabilities of structuring a course of study that will serve their individual needs;
3. A meaningful involvement in the clinical aspects of patient care via affiliations with teaching hospitals and related institutions;
4. A cooperative internship program under the guidance of qualified professional practitioners—to give students the opportunity to acquire the skills and actual experience integral to the total program;
5. A commitment to the search and advancement of new and progressive concepts, ideas, and philosophies of education and professional practice.

### **Facilities**

The College occupies the Mugar Life Sciences Building on the Main Campus of the University. Completed in 1963, this multimillion-dollar facility offers proximity to all the academic and extracurricular activities of the University.

The building and the recently completed addition, with its spacious and well-equipped laboratories and classrooms for both undergraduate and graduate programs, are designed to anticipate the physical needs of a growing and progressive College. In addition to faculty and administrative offices, departmental libraries, and the graduate schools, there are laboratories for radioisotopes, clinical chemistry, medicinal chemistry, drug analysis, prescription pharmacy, clinical pharmacy, hematology, pharmacology, pharmacognosy, respiratory therapy, medical record science, and clinical microbiology. A pharmaceutical manufacturing plant, animal rooms, and complete audio-visual capabilities for all programs are also featured in this five-story structure. Excellent research facilities are available for upper-class students who participate in original research projects.

### **Transfer with Advanced Standing**

The College of Pharmacy and Allied Health Professions may accept qualified transfer students who have successfully completed one or more years of preprofessional course work in an accredited college or university.

### **Degrees Granted**

The degrees of Bachelor of Science, Bachelor of Science in Pharmacy, Associate in Science, and Associate in Science in Dental Hygiene are awarded to qualified candidates.

### **Accreditation**

Each of the programs offered by the College is accredited by the appropriate professional group. The College holds membership in both the American Association of Colleges of Pharmacy and the Association of Schools of Allied Health Professions.

**PHARMACY AND****ALLIED HEALTH PROFESSIONS****Professional Preparation***Aims*

The Pharmacy program is designed to satisfy the increased demand for professionals in the field. The need for well-qualified pharmacists is likely to continue in direct response to increased populations, greater emphasis on health care, and in particular, to the newer and more diversified utilization of those now in practice in this country. The majority are associated with community practice, and approximately one-half of these pharmacists are self-employed. Hospital pharmacy and institutional practice have attracted over 15,000 practitioners and represents the fastest growing area of the profession. The increased use of the pharmacist as a drug consultant to the medical and nursing staffs has broadened the scope of professional opportunity and given practitioners even greater involvement as part of the health team.

Pharmacy also offers careers in research, production, law enforcement, and education; a considerable number of our graduates have entered leading graduate and professional schools. Another significant trend is found in the increasing number of women entering the profession. Approximately one-third of the entering class is now composed of women.

*A View of the Five-Year Major*

The College offers a five-year curriculum which leads to the degree of Bachelor of Science in Pharmacy. The curriculum includes instruction in each of three natural divisions: (1) nonscientific courses in general education (the humanities and social sciences); (2) mathematics and the basic physical and biological sciences; and (3) courses in the areas of professional instruction—medicinal chemistry, pharmacognosy, pharmacology, pharmaceuticals, pharmacy administration, and clinical pharmacy.

The curriculum offers a progressive approach to pharmaceutical education. Emphasis is placed on the biologic and chemical applications of drug therapy, and the College maintains affiliations with several major teaching hospitals in which students undertake a clinical clerkship. Because of an inside range of professional electives and courses offered on an interdisciplinary basis with other basic colleges, the program is sufficiently flexible to give students the opportunity to specialize. Teachers throughout the College use the latest concepts in educational techniques, including extensive application of audio-visual material and directed study opportunities. The academic program is highly coordinated with the cooperative education component to provide meaningful training for a contemporary pharmacist.

In addition, through its Graduate School of Pharmacy and Allied Health Professions, programs leading to the Master of Science and Doctor of Philosophy degrees are offered.

**Graduation Requirements***Degree*

Candidates for the Bachelor of Science in Pharmacy degree must complete all of the prescribed work of the curriculum. Students who undertake the Cooperative Education program must meet the requirements of the Department of Cooperative Education before they become eligible for their degrees.

No student transferring from another college or university is eligible

to receive a degree until at least eight quarters of academic work immediately preceding graduation have been completed at North-eastern. Exceptions to this requirement may be made for students transferring from another college of pharmacy.

### Graduation with Honors

Candidates who have attained superior grades in their academic work will be graduated with honors. Upon special vote of the faculty, a limited number of this group may be graduated with high honors or with highest honors. Students must have been in attendance at the University for at least eight quarters before they become eligible for honors at graduation.

### Accreditation

The program offered by the College of Pharmacy subscribes to the standards established by the American Council on Pharmaceutical Education and the American Association of Colleges of Pharmacy of which it is a member.

### Licensure—Pharmacy

Pharmacists must meet certain requirements to obtain a license from the state in which they wish to practice. These requirements ordinarily include graduating from an accredited college of pharmacy, passing an examination given by a State Board of Pharmacy, and completing an "internship" or apprenticeship.

The internship is a period of supervised practical experience in a preceptor pharmacy. This is generally satisfied during the cooperative work periods commencing at the end of the student's second academic year. During the periods of full-time employment, the salary received enables the student to pay a substantial part of his educational expenses.

### Sample Freshman-Year Program of Studies in Pharmacy

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Basic Math	Calculus	Biology
General Chemistry	L. A. Elective	English
L. A. Electives	Biology	General Chemistry
	English	Basic Pharmacy

*In addition to the above courses, a student may elect to take Basic ROTC.*

### Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Basic Math	4	Anatomy-Physiology	10
*Calculus	4	General Biochemistry	4
*General Chemistry	10	Clinical Biochemistry	4
*English	8	Microbiology	4
*Biology	8	Liberal Arts Electives (9)	36
**Physics	8		
**Organic Chemistry	10		

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*Basic Pharmacy	3	Public Health	3
Pharmacy I & II	8	Professional Practice I	5
Medical Chemistry/ Pharmacology I-IV	20	Jurisprudence	4
Drug Analysis	5	Pharmacy Administration	4
Pharmacy III & IV	8	Professional Practice II & III	8
Pathology	4	Clinical Pharmacy II	7
Toxicology	4	Placement Techniques	1
		Professional Electives (4)	14-20
		General Elective	4
		Introduction to Clinical Pharmacy	3

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.

**DENTAL HYGIENE****Professional Preparation***Aims*

The Forsyth School for Dental Hygienists conducts a program of dental hygiene education and general education in cooperation with Northeastern University. Students in this two-year program attend classes both at the Forsyth Dental Center and Northeastern. The dental hygienist is licensed to render direct preventive services to the patient under the direction of a dentist. Services include administering dental prophylactic treatment, preparing dental radiographs, and teaching prescribed methods of maintaining dental health.

*A View of the Program*

The first year includes courses in anatomy, chemistry, microbiology, nutrition, restorative dentistry, radiology, periodontology, dental hygiene and clinical dental hygiene instruction. In the second year students take general education courses such as English, sociology, and psychology and professional courses in pathology, periodontology, public health, pharmacology, dental materials, and functional dental anatomy and continue to receive clinical dental hygiene instruction.

*Degrees*

Students completing the program will receive the Certificate in Dental Hygiene from Forsyth and the Associate in Science Degree in Dental Hygiene from Northeastern University. Graduates are required to take the state board examinations in the state in which they intend to practice.

**Accreditation**

This program is accredited by the Commission on Dental Education of the American Dental Association.

**Other Information**

Students are admitted directly to the Forsyth School for Dental Hygienists and should contact the school for catalogs and applications by writing to 140 The Fenway, Boston, Massachusetts 02115.

### Sample Freshman-Year Program of Studies in Dental Hygiene

*First Quarter*  
Functional Human Anatomy  
Chemistry  
Dental Anatomy  
Radiology  
Dental Hygiene  
Clinical Dental Hygiene

*Third Quarter*  
Microbiology  
Head and Neck Anatomy  
Restorative Dentistry  
Periodontology  
Applied Nutrition  
Clinical Dental Hygiene

*Second Quarter*  
Functional Human Anatomy  
Chemistry  
Nutrition  
Histology  
Dental Hygiene  
Clinical Dental Hygiene

### Basic Course Requirements

#### I. GENERAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
**English Composition and English Literature	8	**Foundations of Psychology I	4
*Chemistry	6	**Sociology	4
*Microbiology	4	*Functional Human Anatomy	10

#### II. PROFESSIONAL REQUIREMENTS

Course	Q.H.	Course	Q.H.
*Dental Anatomy	3	**Pathology	3
*Radiology	2	***Periodontology	4
**Dental Hygiene	8	**Public Health	4
***Clinical Dental Hygiene	21	**Functional Dental Anatomy	2
*Nutrition	4	**Pharmacology	2
*Histology	2	*Head and Neck Anatomy	2
*Restorative Dentistry	2	**Dental Materials	2

*\*These courses are usually taken in the first year.*

*\*\*These courses are usually taken in the second year.*

*\*\*\*These courses are taken in both the first and second years.*



**MEDICAL LABORATORY  
SCIENCE  
MEDICAL TECHNOLOGY  
Professional Preparation**

*Aims*

Medical technology involves the application of principles of natural, physical, and biological sciences to the performance of laboratory determinations used in the diagnosis and treatment of disease and the maintenance of health. The demand for properly educated and certified medical technologists is increasing as a result of greater emphasis on quantity and quality of health care delivery. With a strong background in hematology, immunohematology, clinical chemistry, and clinical microbiology, a graduate may find a position not only in a hospital laboratory but also in research, industrial, and governmental institutions.

Opportunities are available for graduate study as well as advanced positions in laboratory administration and education.

*A View of the Five-Year Major*

Students enter the College as Health Professions majors in the Medical Laboratory Science program. The College offers a five-year, modified-cooperative course of study which culminates in the degree of Bachelor of Science. Upon completion of the professional segment, the student is eligible to write a national certification examination in medical technology. During the junior and senior years, qualified students are assigned to one of the hospital components of the medical technology program. To qualify for entrance into the hospital component of the program, a student must have an acceptable point average and have completed all University course requirements, including those in biology, chemistry, and mathematics which are required for certification. The professional courses in hematology, pathogenic microbiology, serology, mycology, parasitology, chemistry, instrumentation, and blood banking are given in both the University and the hospital components of the program.

Students will register at the University for 12 quarters including two interim sessions of five days each. This 12-quarter curriculum will include the entire academic program plus all clinical and professional requirements. During the five-year program, cooperative work periods will be regularly assigned.

*Degree*

The degree granted will be the Bachelor of Science. This degree represents not only the formal completion of the subjects in the selected course of study, but also indicates competence in the medical laboratory sciences.

**Accreditation**

Applications for the integrated university-hospitals medical technology program have been submitted to the National Accrediting Agency for Clinical Laboratory Sciences and the Council on Medical Education of the American Medical Association.

**Other Information**

The academic component of the medical technology program is primarily at the University. The clinical component or "internship" is at the New England Deaconess, New England Baptist, Emerson, and Peter Bent Brigham Hospitals.

**Option**

Certain students enrolled in the baccalaureate degree program may elect to write the certificate examination for technician or for cytotechnologist at the associate degree level. Having completed the first two years of the academic curriculum and the basic professional courses, these students may take the appropriate practicum leading to eligibility to write the certification examination for medical laboratory technician or for cytotechnologist and may earn the associate degree at the University.

**Sample Freshman-Year Program in Medical Laboratory Science***First Quarter*

Math or Calculus  
General Chemistry  
General Biology  
English Composition

*Second Quarter*

Math or Calculus  
General Chemistry  
Animal Biology  
Modern Language I or Elective  
Orientation to Medical Laboratory Science

*Third Quarter*

Elective  
English Literature  
Mod. Lang. II or Elect.  
Basics of Medical Laboratory Science  
Dynamics of Health Care

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*English and English Literature	8	Genetics and Developmental Biology	4
*Biology—General and Animal	8	Physics	10
*Math or Calculus	8	Microbiology	4
*General Chemistry	10	Int. Mod. Language and/or other Humanities	12
**Organic Chemistry	10	Social Sciences	12
**Analytical Chemistry	4	General Electives	12
**Physiology	8	Biology Elective	4
Cell Biology	4		

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*Dynamics of Health Care	2	Clinical Chemistry	5
*Orientation to Medical Laboratory Science	1	Clinical Microbiology	5
*Basic Medical Laboratory Science	3	Applied Study (at hospital)	15
Basic M.L.S. Hematology I	3	Communications in the Health Sciences	4
**Basic M.L.S. Hematology II	3	Laboratory Management	2
**Basic M.L.S. Immunohematology	3	Health Science Education	2
**Basic M.L.S. Chemistry and Instrumentation	5	Undergraduate Research	2
**Basic M.L.S. Clinical Microbiology	6	Instrumentation I	2
Hematology	3	Instrumentation II	2
Immunohematology	2		

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.



**MEDICAL RECORD  
ADMINISTRATION**  
**Professional Preparation**

*Aims*

A medical record administrator is prepared to organize, operate, and manage a Medical Records Department. The program will enable the student to be responsible for designing health information and retrieval systems; for planning, organizing, and directing medical record services; for developing, analyzing, and evaluating medical records and indexes; for working with the medical and administrative staffs in developing methods for evaluation of patient care, and in research projects utilizing health care information.

*A View of the Five-Year Major*

In the first two years, the student will concentrate on liberal arts and sciences, including the required human anatomy and physiology courses with an overview of microbiology and pharmacology. Introductory courses in health care science will prepare the student for his role in health administration and health care delivery.

The program includes preparation in administration, departmental and hospital management and organization, and in electronic data processing. The professional courses in medical record science, medical terminology, and hospital law are complemented by directed applied study in medical record science at an affiliated health facility.

*Degree*

The Medical Record Administration program is offered on the Cooperative Plan. Successful completion of the prescribed curriculum, including the directed study at the affiliated hospital, will permit the award of a Bachelor of Science degree. This degree represents not only the formal completion of the subjects in the selected course of study but competence in the field of specialization. Graduates are eligible to write the registration examination given by the American Medical Record Association.

**Accreditation**

This program is approved by the Council on Medical Education of the American Medical Association in cooperation with the American Medical Record Association.

**Special Information**

Students interested in this profession should arrange for an interview with the program director.

**Sample Freshman-Year Program  
of Studies in Medical Record  
Administration**

*First Quarter*

English Composition  
Biology  
Math  
Psychology  
Orientation to Medical Records

*Second Quarter*

Biology  
Math  
Modern Language or Pol. Sci.  
Orientation to Medical Records

*Third Quarter*

English Literature  
Math  
Dynamics of Health Care  
Modern Language and Psychology  
or  
Modern Language and Chemistry  
or  
Psychology & Pol. Sci.  
Drug Uses and Actions

*In addition to the above courses, a student may elect to take ROTC.*

**Basic Course Requirements****I. GENERAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*English Comp. and English Literature	8	Drugs, Use and Action	4
*Mathematics	9	Organizational Behavior	8
Public Speaking	3	Introduction to Computer Science	4
*Biology (General and Animal)	8	*Psychology	4
**Anatomy and Physiology	10	**Sociology	4
**Microbiology	3	*Modern Language or other Humanity	16
Statistics	4	Other Social Science	8
Economics or Western Civilization	8	General Electives	12

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
Orientation to Medical Records	2	Seminar in Medical Records	2
Medical Records Science I-IV	16	Health Science Education	2
Medical Terminology	4	Applied Study	8
Foundations of Medical Science	6	Hospital Organization and Management	3
Hospital Law	2	Application of Med. Comp. Systems	4
Organization and Management Medical Record Dept.	6	*Dynamics of Health Care	2
Applied Health Statistics	4	Quality Assurance	4
		Independent Study	4
		Special Topics	4

\*These courses are usually taken in the Freshman year.

\*\*These courses are usually taken in the Sophomore year.



## **PHYSICIAN ASSISTANT Professional Preparation**

### *Aims*

Lecturers for this program include faculty from the medical schools in the Boston area.

This is a program for the education of the Primary Care Physician Assistant who is a skilled person qualified by academic and clinical training to provide patient services under the supervision and responsibility of a doctor of medicine. The Physician Assistant may work in a variety of settings, such as a physician's office, clinic, hospital, or nursing home. It is expected that the Physician Assistant will be able to do at least the following: elicit a detailed and accurate history, perform a physical examination, perform routine procedures such as the drawing of blood samples, injections, suturing and caring for wounds, counsel the patient on matters relating to health, and provide evaluation and treatment in life-threatening emergencies.

### *A View of the Major*

This 18-month program, which begins in September, includes didactic work at Northeastern University and clinical rotations in medicine, surgery, pediatrics, emergency medicine, psychiatry, and obstetrics at teaching hospitals in the Boston area. Upon satisfactory completion of the program, students will be awarded a certificate by the University.

### *Special Requirements*

The program was originally open only to medical corpsmen in the armed forces, but is now open to other candidates. However, it is not designed for the high school senior entering an institution of higher learning for the first time. Applicants must have successfully completed a minimum of two years of college, including courses in chemistry and biology on the college level. (Since the educational attainment of a majority of applicants exceeds the minimum requirements, those accepted often hold baccalaureate degrees.) In addition, successful applicants must have had at least one year of direct patient care experience.

Scholastic Aptitude Test scores are required for applicants without a degree. Application materials may be obtained by contacting the Physician Assistant Program Office at 202 Robinson Hall or by telephoning (617) 437-3195.

**Accreditation**

The Physician Assistant program meets the requirements laid down by the Council on Medical Education of the American Medical Association as essentials for an approved educational program to train primary care physician assistants. Membership in the Association of Physician Assistant Programs is maintained. The program is also approved by the Massachusetts Board of Approval and Certification of Physician Assistant Programs.

**Other Information**

This program is offered by Northeastern University in cooperation with the Massachusetts Medical Society and the Office of Special Programs in the Department of Health, Education and Welfare.

**Sample First-Year Program of Studies in the Physician Assistant Program***First Quarter*

Anatomy & Physiology I  
Physical Diagnosis  
Principles of Interviewing  
Principles of Pediatrics  
Patho-Physiology and Medicine I  
Roles, Rules, Ethics, and Resources  
for Physician Assistants

*Third Quarter*

Patho-Physiology and  
Medicine III  
Basic Pharmacology  
Applied Study

*Second Quarter*

Anatomy and Physiology II  
Basic Medical Laboratory Science  
Patho-Physiology and Medicine II  
Physiologic Basis of Disease  
Principles of Obstetrics and  
Gynecology  
Principles of Psychiatry

**Basic Course Requirements****II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
Anatomy & Physiology	8	Basic Medical	
Medical Care and Current Social Problems	2	Laboratory Science	4
Essentials of Physical Examination	5	Basic Pharmacology	3
Principles of Interviewing	2	Medical Therapeutics	3
Principles of Psychiatry	3	Survey of Rehabilitation Medicine	2
Physiologic Basis of Disease-Neurophysiology	2	Basic Diagnostic Radiology	2
Patho-Physiology and Medicine I, II & III	6	Principles of Obstetrics and Gynecology	3
Principles of Pediatrics	3	Fundamentals of Electrocardiography	2
Principles and Concepts of Surgical Intervention in Disease Process	3	Roles, Rules, Ethics, and Resources for Physician Assistants	2
		Patient Education and Counseling	2
		Applied Study I-IV	20

**RESPIRATORY THERAPY****Professional Preparation***Aims*

The respiratory therapist is concerned with the diagnosis and treatment of acute and chronic lung disease occurring in patients of all ages—from newborn babies to senior citizens. Practitioners must be able to apply knowledge of basic sciences to use ventilators, oxygen equipment, humidifying devices, and pertinent diagnostic tools. Res-

piratory therapists provide direct minute-to-minute care to patients requiring continuous ventilatory support. Additional therapies include administration of medical gases, aerosol and humidity treatments, intermittent positive pressure breathing, and chest physiotherapy. Other responsibilities include teaching home care techniques to the patient with chronic disease, using and maintaining respiratory function equipment and other electronic and mechanical devices.

### *A View of the Major*

Students enter the College as majors in the Respiratory Therapy program. Mathematics, chemistry, and the physical, biological, medical, and health sciences provide the basis for the professional instruction in Respiratory Therapy. English, psychology, and elective courses in the humanities and social sciences provide the general educational background. Clinical study at the affiliated hospitals provides the opportunity for direct patient care and the immediate application of highly specialized techniques.

### *Degree*

The curriculum leads to the Associate in Science degree and includes all academic quarters at the University, a structured clinical program, and assigned co-op quarters. Successful completion of the program prepares candidates to take the examination of the National Board for Respiratory Therapy and also provides a basis for continuation of study leading to a baccalaureate degree.

### **Accreditation**

This program is approved by the Council on Medical Education of the American Medical Association.

### **Sample Freshman-Year Program of Studies in Respiratory Therapy**

#### *First Quarter*

English Composition  
General Chemistry  
Basic Animal Biology  
Introduction to  
Respiratory Therapy I  
Mathematics

#### *Third Quarter*

Microbiology  
General Chemistry  
Introduction to  
Respiratory Therapy III  
Dynamics of Health Care  
Liberal Arts Elective

#### *Second Quarter*

English Literature  
Calculus  
Introduction to  
Respiratory Therapy II  
Basic Animal Biology  
Medical Terminology  
Physics of Fluids

### **Basic Course Requirements**

#### **I. GENERAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
English Composition and		*Basic Psychology	4
English Literature	8	**General Chemistry	10
Math	8	Pharmacology	4
Anatomy & Physiology	10	**Speech or Communica-	
Physics	3	tions Elective	4
Basic Microbiology	4	Social Science Elective	4
		Liberal Arts Electives	12

**II. PROFESSIONAL REQUIREMENTS**

Course	Q.H.	Course	Q.H.
*Dynamics of Health Care	2	Clinical Seminar	2
*Respiratory Seminars	3	Resp Care for Critical Patients	3
Cardio-Pulmonary		Found of Med Science	3
Physiology	4	Cardio-Pulmonary Lab	
Intro to Patient Care	3	Technology	3
Prof. Practice Labs I, II,		Cardio-Pulmonary Lab	
III, IV	4	Practice	1
Cardio-Pul Disease	4	Foundations of Clin Lab	4
Intro to Respiratory Care	3	Health, Disease,	
Clinical Practice I and II	8	and Disability	4
Resp Care for		Hospital Law	2
Med, Surg Patients	3		

\*These courses are usually taken in the Freshman Year.

\*\*These courses are usually taken in the Second Year.

**Human Services**

An interdisciplinary major involving the

College of Criminal Justice

College of Education

College of Liberal Arts

**ADVISERS Criminal Justice**

Robert D. Croatti, M.Ed., *Assistant Dean*

**Education**

Professor Susan E. Massenzio, Ph.D.

Professor Barbara Schram, Ed.D.

Allison S. Young, *Administrative Assistant, Office of the Dean*

**Liberal Arts**

Ruth H. Karp, M.A., *Associate Dean*

Professor Wilfred Holton, Ph.D.

Professor Edward M. Humberger, Ph.D.

Professor Harold Zamansky, Ph.D.

Jane P. Graham, M.Ed., *Assistant to the Dean*

John C. McCarthy, M.Ed., *Assistant to the Dean*

**COORDINATORS** Professor Barbara Schram, Ed.D., *Coordinator*

Professor Wilfred Houlton, Ph.D., *Associate Coordinator*

~ Professor Susan E. Massenzio, Ph.D., *Associate Coordinator*

**Professional Preparation****Aims**

The program in Human Services is designed to enable students with a bachelor's degree to enter a career in one of the areas broadly de-

defined as "Human Services." The program is interdisciplinary and was planned by three of the Basic Colleges at Northeastern to provide fundamental knowledge and skills which will enable a graduate to enter a meaningful career, as well as graduate education.

Students in the Colleges of Criminal Justice, Education and Liberal Arts who major in Human Services may be prepared to perform a variety of functions in public and private agencies, including the following: placement and career counseling; case work services in social service and welfare agencies; participation in therapeutic treatment programs in general and/or mental hospitals; supportive counseling in community health centers; rehabilitation counseling services; work evaluation in sheltered workshops; parole counseling; court liaison in programs for delinquent youth; staff work in half-way houses, penal institutions, drug treatment centers; and supportive counseling for the mentally retarded.

Since the number and type of agencies delivering Human Services have expanded and continue to expand, the above list only begins to suggest the career possibilities for the Human Services major.

### *Description of Major*

An integral part of the Human Services program is a continuing formal advisory system to help students make the best use of their early course selections and to guide them to appropriate upper-level courses.

There are five basic aspects to the program as follows:

1. *College Requirements.* Degree requirements vary for each participating college. Refer to pages 66-68 for requirements in the College of Criminal Justice; to pages 69-74 for requirements in the College of Education; and to pages 106-111 for the College of Liberal Arts.
2. *Prerequisite Courses.* Eight courses in the areas of Economics, Human Services, Political Science, Psychology, and Social Science are required.
3. *Core Courses.* These consist of 11 courses in the areas of Community Planning, Counseling and Casework, Group Process, Organizational Behavior, Rehabilitation, and Social Welfare.
4. *Concentrations.* A group of four courses focused on a student's area of interest is selected in close cooperation with an adviser.
5. *Supervised Field Experience.* During the last two years, the Human Services major is required to work under supervision in such settings as community centers, nursing homes, and mental health, correctional or recreational facilities, depending upon his concentration. The experience is closely supervised to maximize the integration of on-the-job learning with University course work.

### *A view of the Major*

As noted above, in addition to providing a firm grounding in areas of basic knowledge, students will build on this foundation with skill courses to help prepare them to understand and work with a variety of helping services.

For specific details on degree requirements, a student should consult his Human Services adviser, a counselor in the Office of the Dean of his college, or a member of the Advisory Committee of his college.

## Other Schools and Colleges of the University

### LINCOLN COLLEGE

In addition to full-time curricula described earlier in this bulletin, Lincoln College offers interdisciplinary and certificate programs providing technological and professional development opportunities to meet special needs of the part-time student. These programs are designed to provide trained people for ready assimilation into industry and to prepare students for the challenge of interfacing technology and society.

The part-time evening program includes pretechnology preparatory courses and degree programs leading to the Associate in Engineering (A.E.), and the Bachelor of Engineering Technology (B.E.T.) in Civil, Mechanical, and Electrical Engineering Technology. The Associate in Science degree may be earned in the Mathematical, Physical, and Chemical sciences.

In recognition of the need for greater technical efficiency in fighting fires—better fire investigators, fire prevention, and fire protection—Lincoln College, in collaboration with local agencies, has designed a part-time evening program leading to an Associate in Science degree in Fire Technology. The curriculum includes a broad spectrum of those science technologies which are basic in coping with today's complex fire-fighting problems.

### UNIVERSITY COLLEGE

University College is committed to the education of mature, adult students who wish to live effectively in today's complex society. Programs are specifically designed to satisfy their changing professional, cultural, and social needs and interests.

Degree programs have been developed in 39 major fields of study in the areas of business administration, education, liberal arts, law enforcement, therapeutic recreation, and health-related programs. Flexible curricula are offered on a part-time basis Monday through Saturday during day and evening hours convenient to adult students.

- Students may elect single courses or may enroll in full degree programs leading to the Associate in Science or the Bachelor's degree. Short-term seminars are also offered for credit. Classes are scheduled in locations which are accessible to the urban and the suburban community. Students may attend classes at the Huntington Avenue Campus, Boston, or the Suburban Campus, Burlington, Massachusetts, as well as other off-campus locations north, south, and west of Boston.

University College programs are constantly evaluated and redesigned when necessary to keep pace with the changing needs and interests of its students and the community.



Program advisers are available by appointment day and evening in the University College Office. They can assist the student in planning a program suitable to his general educational and career objectives and can also answer questions relating to degree requirements, course sequence, and proper scheduling of courses. Appointments may be arranged by calling the University College Office (437-2400) or by coming in person to 102 Churchill Hall. There is no charge for this service.

Program advisers are also available during registration at all registration sites. No appointment is necessary.

## **GRADUATE AND PROFESSIONAL SCHOOLS**

The 10 graduate and professional schools of the University offer day and evening programs leading to degrees as follows:

### **Actuarial Science**

Master of Science in Actuarial Science.

### **Arts and Sciences**

The Master of Arts degree may be earned in Economics, English, History, Political Science, Psychology, Sociology, and Social Anthropology. The Master of Science degree is available in Biology, Chemistry, Clinical Chemistry, Forensic Chemistry, Mathematics, and Physics. The Master of Science in Health Science and the Master of Public Administration degrees are also offered. In addition, there are programs leading to the Doctor of Philosophy degree in Biology, Chemistry, Economics, Mathematics, Physics, Psychology, and Sociology.

### **Boston-Bouvé**

Master of Science with specializations in Physical Education and Recreation Education. Graduate courses in Health Education are available as electives within the College and for special students.

### **Business Administration**

Master of Business Administration. There are three methods of securing an M.B.A. degree: full-time, internship, and part-time study. The full-time student may complete the program in one to two years of academic study. The internship blends fifteen months of academic study with six months of coordinated work as an intern in a business or nonprofit organization for a total program time of 21 months. Part-time students have the advantage of attending classes in the late afternoon and evening to learn the theory behind the practical application of their employment. Full-time students may also apply for an assistantship which combines their studies with academic experience in the College of Business Administration.

### **Criminal Justice**

Both full- and part-time programs are offered leading to a Master of Science degree in Criminal Justice and a Master of Science degree in Forensic Chemistry. Students enrolled in the Master of Science program in Criminal Justice choose among two major concentrations of study—administration, policy development, and planning or behavioral science theory and research. The Master of Science program in

Forensic Chemistry provides an integrated survey of forensic science as utilized in criminalistics, toxicology, and related professional fields. An interdisciplinary Ph.D. program in Forensic Chemistry is also offered with specialization in either (a) Forensic Toxicology (b) Forensic Materials Science or (c) Forensic Analytical Chemistry. A distinctive feature of the programs is that students have the advantage of attending classes in the late afternoons and evenings.

### **Education**

The Master of Education degree may be earned with specialization in Counselor Education (elementary, secondary schools, community mental health, higher education, cooperative education, rehabilitation), Curriculum and Instruction, Early Childhood Education, Educational Administration, Educational Research, Human Development, Rehabilitation Administration, Special Education, and Speech Pathology and Audiology. The Certificate of Advanced Graduate Study is offered in Counselor Education, Educational Administration, Rehabilitation Administration, and Special Education Administration. The Doctor of Education degree may be earned in Leadership with specializations in Counselor Education, as well as school, rehabilitation, and special education administration.

### **Engineering**

The Master of Science degree may be earned with specification in the fields of Chemical, Civil, Electrical, Industrial, Mechanical Engineering, and Engineering Management, including a six-year program in Power Systems Engineering leading to both bachelor's and master's degrees in Electrical Engineering; a special five-year honors program in Mechanical and Electrical Engineering leading to both bachelor's and master's degrees; the Professional Engineer degree in Mechanical, Industrial, and Electrical Engineering; the Doctor of Engineering degree in Chemical Engineering; and Ph.D. degree in the fields of Electrical, Chemical, Civil and Mechanical Engineering. A special interdisciplinary program leading to the Master of Science in Transportation is also offered.

### **Law**

The School of Law offers a full-time program of professional instruction, leading to the degree of Juris Doctor (J.D.). There are no courses for part-time or evening students.

The School of Law is the only law school in the U.S. based on the co-operative plan. It is a full-time, three year, day program and is accredited by the American Bar Association and the American Association of Law Schools.

After completing the first year curriculum, each student must take on full-time professional jobs with a private firm, a government agency, a legal service organization or a corporate law department. Students alternate work experience and academic quarters and complete their legal educations in the normal three year law school time. Because the law school operates twelve months a year, each student graduates with the accepted academic requirements (7 quarters) together with a full year (4 quarters) work experience.

### **Pharmacy and Allied Health Professions**

The Master of Science degree is offered in Hospital Pharmacy, Medical Laboratory Science, Clinical Chemistry, Medicinal Chemistry, Pharmacology, and Radiopharmaceutical Science. The Ph.D. degree

is offered in Medicinal Chemistry with an interdisciplinary Ph.D. degree available in Clinical Chemistry, Forensic Chemistry, Pharmacology, and Radiopharmaceutical Science.

### **Professional Accounting**

Master of Science in Professional Accounting. The concentrated 15-month program is designed to prepare liberal arts and other non-accounting majors for a career in professional accounting and for the CPA examination. The five-quarter course includes a three-month internship with a leading CPA firm in the middle or winter quarter which provides both practical experience and significant financial support.

New classes start in mid-June of every year.

*Some of these programs are offered on the Cooperative Plan; others provide teaching and research fellowships for able candidates.*

## **THE BUREAU OF BUSINESS RESEARCH**

The Bureau of Business Research gives administrative assistance to research projects carried out under faculty leadership and supervision and is an integral part of the College of Business Administration.

## **THE CENTER FOR MANAGEMENT DEVELOPMENT**

The Center, which is sponsored by the College of Business Administration, offers programs designed to provide professional growth for middle and senior managers. Two programs are scheduled three times per year, the Management Development Program (MDP) and the Management Workshop. In both, participants are sponsored by their employers. The Center also designs and conducts special programs for a wide range of business organizations.

The MDP is a graduate-level course in business for managers who have already had responsibility for a major risk, function, department, division, or independent enterprise. Six weeks of in-residence instruction are spaced over a five-month period, October to February or January to May.

The Management Workshop provides a comprehensive outline of the major areas of business through graduate-level courses in organizational behavior, financial analysis and control, operations management, marketing, and economic forecasting. It meets for 12 consecutive Fridays, beginning either in September, January, or March.

## **CENTER FOR CONTINUING EDUCATION**

The Center for Continuing Education offers a results-oriented educational experience. Its goal is to help students toward more effective performance in their present work and to build on their potential for future responsibilities in a fast-changing world. Coursework is shaped by the principles of adult learning, enhancing awareness and perception, improving personal relationships, and assisting in career growth and personal development. (437-2600.)

## **INSURANCE INSTITUTE**

The Insurance Institute, sponsored by local insurance organizations and companies, is part of University College. It offers a number of noncredit courses in preparation for the Chartered Life Underwriter and Chartered Property-Casualty Underwriter designations, as well as for the General Insurance, Insurance Adjuster, and Risk Management Certificates. (437-2506).

# PART III



# PARTICULARS OF EDUCATION

## PARTICULARS OF EDUCATION

### About Admissions

To find a college or university which will suit one's needs and interests—a place where one can learn to feel at home and make sound preparation for a future career—is a goal of every student who plans to continue his education beyond secondary school. This can be achieved in a number of ways, such as talking with enrolled students, faculty and alumni, and by reading catalogues. A visit to the college campus should be high on one's list of priorities. The Committee on Admissions extends a cordial welcome to all prospective students and has planned a series of on-campus experiences to make a visit as worthwhile as possible.

#### The Admissions Conference

It is only natural that students should have many questions about Northeastern—its programs of study, its services to students, and the Cooperative Plan of Education. For this reason, the Committee on Admissions sponsors a series of Orientation Conferences for students. Offered at 10:00 a.m. and 2:00 p.m. on Mondays and Fridays from October 1 through May 1 (except for legal holidays), these conferences have been most successful in helping students become better acquainted with the University. They include a film and appropriate comments by an admissions counselor. This is followed by an informal question-and-answer period.

Special group sessions are also held in the summer between July 1 and September 1. Further information about these summer conferences may be obtained from the Admissions Department.

#### Guided Tours

Guided tours of the campus are held daily, Monday through Friday, at 11:00 a.m. and 3:00 p.m. Both the admissions conference and the tour should be scheduled in advance by writing or calling the undergraduate Admissions Office (617-437-2211). The opportunity to visit the University's facilities and to observe student life on campus is one important way to learn about Northeastern. Commuting students who wish to visit the University's Suburban Campus in Burlington are encouraged to do so. This will appeal especially to those whose home communities are on the North Shore of Boston.

#### The Interview

Although it is not required, the personal interview is generally regarded as an appropriate time for students with special questions to meet with an admissions counselor. In studying the secondary school record, the counselor may discover some factor which merits further explanation. In this event, the applicant may be asked to arrange a visit to the Admissions Office. The interview, therefore, may be held at the request of the student or the counselor. In most cases, contacts with admissions personnel will be more beneficial if the *University Bulletin* has been carefully studied before the personal interview.

**Special Note**

Northeastern does not hold classes for students in the Basic Colleges on Saturdays; hence, guided tours cannot be provided at that time. A weekday visit to the University is recommended. Special Saturday appointments are arranged on a limited basis, however.

**GENERAL  
REQUIREMENTS FOR  
ENTRANCE**

An applicant for admission to Northeastern University has, ideally, completed a secondary school program that challenged his ability—a program that includes courses in English, foreign language, mathematics, laboratory science, and history. Proficiency in a foreign language is especially important for students entering the College of Liberal Arts. But the overall school record has importance in itself both as an indication of achievement in subjects critical to university study and as a reflection of a wise choice of electives. Candidates are encouraged to broaden their reading outside of class. The student who can communicate ideas, understand the meaning of words, and write effectively is at a distinct advantage. Most importantly, the high school transcript should provide clear evidence of sound study habits so vital to success in higher education.

Today's high school students have had the advantage of many innovations that have greatly enriched their experience—independent study, small group seminars, research projects, and off-campus experiences related to community service or future vocations. Northeastern is understandably interested in the growth of the work/study concept in many secondary schools, and the Committee on Admissions looks with favor upon the variety of these worthwhile experiences.

The University has also introduced flexibility into its programs so that students may explore alternate fields or tailor their programs to personal goals. Although they may be asked to indicate a major for the purpose of having faculty or co-op advisers assigned to assist them, candidates for admission to the Colleges of Business Administration, Engineering, Liberal Arts, or Education do not have to make a definite choice of major until the end of the sophomore year. Many elective courses are now available to freshmen.

Obviously, attendance at a University means the opportunity to change a program of study, in many cases without loss of credit, as new interests develop. The possibilities can be discussed with a counselor in the Office of the Dean of Students at any time during the freshman year.

### **Preparation for Study in Engineering, Science and Mathematics and Allied Health Professions**

It is only natural that evidence of special aptitude and the highest possible level of preparation in the sciences and mathematics should be required for entrance to certain programs of study offered by the University. Such programs include:

#### *Boston-Bouvé College*

Health Education  
Physical Education  
Physical Therapy

#### *College of Education*

The teaching of Science/  
Mathematics, Speech  
and Audiology

#### *College of Engineering*

All programs

#### *College of Liberal Arts*

Biology, Chemistry, Geology,  
Mathematics, Physics

#### *College of Nursing*

A.S. Degree program  
B.S. Degree program

#### *College of Pharmacy and Allied Health Professions*

All programs

#### *Lincoln College*

B.E.T. Degree program

Courses in science and mathematics vary greatly in terminology, teaching methods, and content. Applicants are encouraged, however, to complete the full sequence of such courses if possible. Experience has shown that students in programs emphasizing mathematics and science need courses in the social sciences and humanities to be fully prepared for professional courses.

### **Preparation for Study in Business Administration**

Candidates for admission must have successfully completed a strong preparatory program in high school. Pragmatically, the College aims to give men and women the opportunity to become educated to a level of competence in their respective fields, thus enabling them to choose between an immediate professional career or graduate school. While mathematics plays an important role in the total program, strong emphasis is also placed on liberal studies to effect an intellectual balance with liberal and appreciative courses.

### **Preparation for Study in the Social Sciences, Teaching, and Criminal Justice**

Many candidates for admission have enjoyed their greatest success in areas other than mathematics-science. Their interests lie quite naturally in the study of the humanities and social sciences. Thus such a student may choose to apply for admission to one of the following programs:

#### *Boston-Bouvé College—(Recreation Education)*

The major in Recreation Education is developed from a broad liberal arts foundation. Students may select an emphasis in Community Recreation, Outdoor Education and Conservation, or Therapeutic Recreation for work with the retarded, the handicapped, or the aging.

#### *College of Criminal Justice*

By its very nature, the program in Criminal Justice requires a strong base of liberal arts study before professional courses are introduced. Applicants for admission should therefore demonstrate an ability to succeed in their study of the behavioral, social, and human services.



*College of Education*

Professional courses are based upon a strong foundation of liberal arts study in the humanities and social sciences. Elementary Education majors may focus on any one of six areas, including preprofessional Special Education and Early Childhood Education. Secondary Education majors typically choose among English, Modern Languages, Social Studies, Human Services, and Music Education. (An audition is part of the admissions procedure for Music Education candidates.)

*College of Liberal Arts*

Broad and flexible programs are offered to meet a variety of student interests in African-American Studies, Anthropology, Art History, Drama, Economics, English, History, Human Services, Journalism, Modern Languages, Music, Philosophy, Political Science, Public Administration, Psychology, Sociology-Anthropology and Speech Communication. A wide selection of electives enables students to broaden horizons while developing depth in the field of their major.

### **Entrance Examinations (Freshmen)**

Research clearly indicates that the best single predictor of academic success is achievement in secondary school. Thus, this factor, together with the recommendations of the school counselor, weigh most heavily in the evaluation process. Although the Scholastic Aptitude Test and three Achievement Tests of the College Entrance Examination Board are required, the Committee on Admissions does recognize that these test results do not measure such qualities as determination, imagination, and leadership.

In 1977, the College Entrance Examination Board will introduce a twenty-minute writing sample as part of the English Composition Test. Applicants are encouraged to complete the sample since it will be used to assign students to appropriate freshman English sections. Students whose native tongue is not English may substitute the test of English as a Foreign Language (TOEFL) for the English Composition Test. Two other achievement tests are required in subjects in which the student feels most confident. No single schedule of testing is recommended, but applicants are advised not to take subject matter tests unless they are currently studying such subjects.

*For full information about College Board Examinations, consult a school guidance counselor or write directly to:*

*The College Entrance Examination Board  
Post Office Box 592  
Princeton, New Jersey 08540  
or  
Post Office Box 1025  
Berkeley, California 94701*

*The American College Testing Program may be substituted for the College Board Testing Program.*

*For full information, write to:*

*American College Testing Program  
P.O. Box 168  
Iowa City, Iowa 52240*

Admissions counselors will also be glad to answer questions about these testing programs.

### **Advanced Placement**

The University grants advanced placement credit to those students with a score of three or better in their Advanced Placement Examinations. Such students are excused from the basic courses in Art History, Classics, Modern Languages, English, History, Chemistry, Mathematics, Music, Biology, and Physics and in the advanced courses in languages to which the Examinations apply. They receive full credit for those courses from which they are excused.

Applicants are required to write the Advanced Placement Tests of the College Board in May.

### **College Level Examination Program**

The University cooperates with the College Entrance Examination Board in its CLEP Program. Qualified students are encouraged to write the general and/or subject matter examinations of CLEP, with the result that college credit may be allowed upon entrance. In general, the Committee on Admissions accepts the score range recommendations of the College Board. Northeastern University has been designated a CLEP Testing Center. Inquiries may be addressed to Counseling and Testing Center, Room 302, Carl S. Ell Student Center Building.

## **APPLYING FOR ADMISSION AND PLANS OF ADMISSION**

### **Entry Dates**

Northeastern University admits students to all programs in September and also has a January entrance date for most of its programs. In addition, certain freshmen and transfer students may enter in the April and June quarters.

The application should be filled out properly, signed, and forwarded to the Dean of Admissions, Northeastern University, Boston, Massachusetts 02115. There is a \$15.00 application fee. Checks should be made payable to Northeastern University. It is to the student's advantage to submit his application for admission promptly. *The student is also responsible for making sure that his transcript and College Board scores are submitted to the University.*

### **Rolling Admission Plan**

Under Northeastern's Rolling Admission Plan, candidates may be notified of their acceptance at that point in their secondary school careers when there is sufficient evidence that they will be able to profit from study at the university level. This may occur early in the senior year or after the results of College Board Examinations have been evaluated. In all cases of acceptance, candidates are to successfully complete the senior year of high school.

### **Deferred Admissions Plan**

An increasing number of students seek information about deferring admission, perhaps to travel, or to improve their financial resources through employment before entering college. Accepted students who wish to participate in the Deferred Admissions Plan will be asked to describe the activities they plan for the coming year before enrollment. Information on the Plan is available from the Admissions Department.

### **Early Admission—Juniors, Second Semester Seniors**

In certain cases, students may enroll at Northeastern prior to high school graduation. Such students may enroll at Northeastern either in September or January, thereby reducing the time to complete degree requirements by one year. A special form provided by the Admissions Committee requires the endorsement of the school principal or guidance counselor for early admission. Write to the Department of Admissions for further details.

### **Freshman-year Alternative Program**

University College of Northeastern University was developed many years ago to serve those students whose needs were not fully met by traditional full-time college programs. In University College, lectures and instructional classes meet for somewhat longer periods of time but less frequently during the week; thus students taking a particular course may come to the University only once or twice a week instead of three or four times which is the standard pattern.

Through University College, students have the opportunity to plan a Freshman-Year Alternative Program with the assistance of our Admissions Department. This flexible pattern allows students who are not ready to assume a full load of courses to test their ability to do college work and sample different areas of interest prior to committing themselves to a specific major field of study.

Students enroll for ten quarter hours credit for the first academic quarter. Following the successful completion of this work, students, in collaboration with their counselors, may progress to 14 or 16 quarter hours of credit in their second or third terms, etc.

Students enrolling under this plan are regular Northeastern University students. Schedules are normally set so that much time remains within the week for employment. After successfully completing 40 quarter hours' credit, students can transfer to many of the Basic Colleges or stay with University College and obtain a degree. For further information, write to the Admissions Department.

### **Programs for Minority Group Students**

Northeastern University deliberately seeks to expand educational opportunities for deserving minority group students and to recruit promising students from economically and culturally disadvantaged backgrounds. In so doing, it has increased its guidance and other supporting services in order that such students may be assured the opportunity to succeed in their chosen fields of study. Supporting services include tutorial study and programmed instruction. These and other counseling services are provided by the University's African-American Institute.

### **Project Ujima Program**

"Ujima" is Swahili for "collective work and responsibility." The purpose of Northeastern's Project Ujima is to assist minority group students in developing their potential to the fullest extent.

This program is designed to make students aware of their potential and to urge them to strive forward with direction and purpose. Special programs such as minicourses, counseling seminars, tutorials, and training sessions are provided to meet the needs of high risk students.

## Open Campus Courses

Under Northeastern University's Open Campus Plan, qualified high school students who can gain release from their schools are invited to undertake collegiate study at Northeastern for credit while still enrolled in secondary school. In this way, the student is able to gain a better idea of the collegiate situation while he works toward college credit. For further information, write to the *Admissions Department*.

## Cooperative Freshman-Year Programs

### College of Engineering

Each June, the College of Engineering will admit a certain number of students under a special Cooperative Freshman-Year Program.

Students may enter Northeastern University in the June following completion of their senior or junior years and complete Quarter One of their freshman year from June to September.

Graduating seniors will then continue their freshman academic program or undertake a cooperative work assignment. This first cooperative work assignment normally occurs either in the Winter Quarter (January to March) or in the Spring Quarter (April to June). Under special circumstances, and at the discretion of the faculty coordinator, freshmen may be placed in September, following completion of their first academic quarter. After this work assignment, the student will return to Northeastern and complete the freshman year. This schedule will be based upon the professional judgement of the Cooperative Education Department and the academic progress of the student.

By extending the freshman year, enrollees will have the opportunity to defray a considerable portion of their first year expenses.

Juniors will have the option of returning to their secondary schools following the summer term with credits earned toward a college degree or staying on at Northeastern, with the permission of their secondary schools, as members of the freshman class. If the student remains at Northeastern, he/she will then participate in a cooperative work assignment similar to those held by graduating seniors, either in the Fall or Winter quarters. For additional information, write to the Admissions Department.

### College of Business Administration

Each June, the College will admit a certain number of students under a special Cooperative Freshman-Year Program.

Students who have completed their senior year may enroll for the Summer Quarter (June-September) and then remain for the Fall Quarter. They will start the cooperative work program in either the Winter or the Spring Quarter, assuming departmental permission.

Summer	Fall	Winter	Spring	Summer
1. School	School	Co-op or School	School Co-op	Co-op Co-op
2.		School	Co-op	Co-op
3.		Co-op	Co-op	School

By extending the freshman year, enrollees will have the opportunity to defray a considerable portion of their expenses. The options will be limited to a relatively small number of students. For additional information, write to the Admissions Department.

## Special Students

A limited number of special students may be admitted to the Basic Colleges. Special students are not degree candidates, and must meet criteria set by the college.

Those admitted as special students usually have completed some college-level work. Applicants who may be considered are:

- a college or university graduate who needs additional course work to prepare or qualify for a graduate program;

- individuals, recommended by deans or program directors, who need particular formal course work to meet professional requirements for certification;

- students who need several courses to complete degree requirements at another college or university, provided they have written approval from the dean of their college; others who are recommended by deans of the colleges to take courses leading to regular admission. In such cases, however, Special Student enrollment should be limited to one academic quarter.

All special students will be charged a non-refundable application fee of \$15.00. Before obtaining and paying for an application, the potential special student should consult a counselor in the office of the dean of the college offering the course(s) desired. Tuition will be at the quarter-hour rate in effect at the time and must be paid before registration is valid. Special students will be admitted to classes only when there is space available.

All special students must obtain approval from the office of the dean of a Basic College prior to each quarter's registration, but will be required to pay the application fee only once.

They should contact the Dean of the college in which they wish to enroll.

## Foreign Students

Foreign students are required to complete and file the regular freshman or transfer application at least six months before registration. They must meet all admission requirements including the standardized tests administered by the College Entrance Examination Board. All academic credentials should be translated into English before forwarding them to the Department of Admissions. After notification of acceptance, students must pay the required deposits and complete the University's Declaration and Certification of Finances Form before an I-20 Form can be forwarded.

Students may obtain a copy of the Foreign Student Admissions Booklet by writing to the Department of Admissions.

Applicants for admission to the bachelor's program are expected to attain a TOEFL score of at least 450. The University will accept candidates with lower scores if they have demonstrated outstanding academic ability in secondary school. For both students whose native language is not English, and those with special language needs, Northeastern offers intensive English for International Students (without academic credit) and Freshman English for International Students (a full-credit alternative to the Freshman English course required of all students). Assignment is based on academic credentials and placement tests.

## ADMISSION OF TRANSFER STUDENTS

A student wishing to transfer into the Basic Colleges of Northeastern University may request advanced standing as an upperclassman on the basis of acceptable credits earned in an accredited two- or four-year institution or a technical institute.

### Basic Requirements

Full details of the University's transfer policy are available in the Transfer Booklet. This publication will be mailed to you upon request. Following are the basic requirements:

1. Only a candidate who presents satisfactory college records may be considered for advanced standing credit.
2. Credit will generally be given toward a NU degree for any reasonably equivalent course completed with a satisfactory grade at another accredited institution.
3. Candidates must be in good standing and eligible to continue in the institution they are currently attending.
4. Evidence of honorable dismissal and satisfactory health are required.

### Application Procedure

Complete transfer application for admission no later than July 1 if September entrance is planned. In certain programs, enrollment is possible at the beginning of each Northeastern quarter of study.

*Submit a high school transcript.*

*Request that an official transcript from each college attended be sent. This should include a list of courses which will be completed prior to the end of the academic year.*

NOTE: Transfer students are not required to complete entrance examinations.

### Financial Aid for Transfers

A number of scholarships, loans, and grants are available to qualified transfer students.

## REQUIRED DEPOSITS FROM FRESHMEN AND TRANSFER STUDENTS

If the Committee on Admissions makes a favorable decision on a student's application, he will be asked to submit a nonreturnable tuition deposit of \$100 by April 1. This deposit serves as an indication of his intention to enroll and is applied to his first-quarter tuition account. A dormitory deposit of \$100 is due at the same time for resident students. Requests to extend the deposit date to May 1 will be honored if they are submitted, in writing, to the Committee on Admissions no later than March 15. In certain programs, due to our waiting lists, extensions are not usually granted.

Accepted students who are recipients of a financial aid package from the University must submit deposit(s) by April 1. If this policy creates a financial hardship or other difficulty, we ask that you contact the Committee on Admissions.

Students applying for entrance other than in September should carefully read their certificate of acceptance which will indicate their required deposit dates.

## **GENERAL AND SPECIAL HEALTH REQUIREMENTS All Students**

Prior to registration at Northeastern, each applicant must submit evidence of a complete medical history and physical examination on a Student Health Service Form supplied by the University. This will include a Tuberculin Test performed within six months of the admission date. This information must be forwarded to the University physician for his review. Proper health clearance is considered a condition of admission.

Except in the most extreme instances, neither physical nor emotional problems are considered a bar to admission. In fact, we are actively encouraging handicapped students to become part of the University community. With pertinent information, we can usually make the adjustments to college life smoother and supply special aids when needed.

Sound health and physical fitness are especially important for students in the Boston-Bouvé College and the College of Nursing and are required by their nonuniversity affiliations. Candidates for admission to these colleges are therefore required to receive special health clearance prior to enrollment. A second health examination, by University Health Services, is given in the third year for students in Boston-Bouvé College and prior to affiliation for students in the College of Nursing.



## College Expenses

Students are advised that tuition rates, room and board charges, and fees are subject to revision by the Board of Trustees at any time. They should also note that the freshman year consists of three quarters of full-time study. The Cooperative Plan, whereby students may be gainfully employed, does not begin until the sophomore year.

The primary purpose of the Cooperative Plan is to provide invaluable on-the-job training, but it can make education possible without the accumulation of a large personal debt. Because of the Plan—and the University's determination to keep basic expenses as low as possible—many deserving students who might not otherwise be able to afford an education have attended Northeastern.

### EXPENSES FOR THE FRESHMAN YEAR (Three Quarters)

Tuition for the freshman year is \$2,610.00. For those who enroll in September, the tuition is payable in three installments at the beginning of the fall, winter, and spring quarters. For those who enroll in January, payments are due at the beginning of the winter, spring, and summer quarters.

Board and room expenses for those living in University-sponsored residence facilities vary slightly according to the dormitory to which a student may have been assigned. These costs are also paid in three installments at the beginning of each quarter, and are on a seven-day-a-week arrangement.

#### Total Freshman Expenses

Application Fee	\$ 15.00
Tuition	2,610.00†
Board and Room (if applicable)	2,100.00*†
Student Center Fee	37.50†
Infirmary Fee (if applicable)	60.00†
Health Services Fee	120.00
ROTC Deposit (if applicable)	25.00
(for uniform, equipment, etc.)	
Laboratory Deposit (if applicable)	20.00
(\$5.00 charge for extra cards)	
Books and Supplies	150.00
Personal Expenses	250.00

† Payable in three installments at the beginning of each freshman quarter: September 26, 1977, January 2, 1978, and April 3, 1978 (or for those who enroll in January, the dates would be January 2, 1978, April 3, 1978, and June 26, 1978).

\* This scale is for Speare and Stetson Halls. See Housing section, page 209.

#### SPECIAL NOTE:

Nonrefundable deposits of \$100 for tuition and \$100 for board and room are payable not later than April 1. These deposits are applied to the first quarter costs. The board and room deposit serves to reserve a space in a University dormitory.

Students who enroll in September will have a vacation period of 13 weeks between the freshman and sophomore years. Generally, Northeastern students use this period to earn money toward tuition costs.



## EXPENSE FOR UPPERCLASSMEN

	Tuition for Bouv�, Nursing, Pharmacy	Tuition for all other Colleges except Engineering	Tuition for Engineering
<i>Division A</i>			
September 26, 1977	\$1182.50	\$1172.50	\$1207.50
April 3, 1978	1182.50	1172.50	1207.50
<i>Division B</i>			
January 2, 1978	1182.50	1172.50	1207.50
June 26, 1978	1182.50	1172.50	1207.50
<i>*Division C</i>			
September 26, 1977	1182.50	1172.50	1207.50
January 2, 1978	1182.50	1172.50	1207.50
April 3, 1978	1182.50	1172.50	1207.50

*\* Division C is the term used to denote the classification of students who are temporarily or permanently on a noncooperative academic year. Certain students in the College of Liberal Arts may elect a noncooperative four-year program. In other colleges, this program is a temporary one sometimes required of transfer students to phase into the Cooperative Plan.*

## REQUIRED FEES FOR ALL STUDENTS

### Application Fee

A fee of \$15 is required when the application for admission is filed. This fee is nonreturnable.

### Accident and Sickness Insurance

The University provides an excellent hospital insurance and student health program. All students will pay a nonrefundable University Health Service fee of \$120 per year. This fee will cover the group Blue Cross-Blue Shield program and the medical services which are provided to students by the University Health Service.

### Student Center Fee

All students in the Basic Colleges on the Huntington Avenue campus are charged a fee of \$12.50 per quarter for the services available in the Student Center building.

### Graduation Fee

A fee of \$25 covering graduation is required by the University of all candidates for a degree. This fee must be paid before the end of the fifth week of the last scholastic quarter in the senior year. Candidates in the College of Nursing are required also to pay a charge of about \$10 for their graduation pin.

## BOSTON-BOUV  COLLEGE UNIFORMS

Students in the Physical Therapy program are required to purchase a uniform for physical therapy procedures and physical education; the cost is approximately \$20. The cost of required clinic uniforms for the senior year is approximately \$100.

## COLLEGE OF NURSING UNIFORMS

Students in the Associate Degree Program purchase uniforms in the fall quarter of the freshman year.

Students in the Baccalaureate Degree Program purchase uniforms in the fall quarter of the sophomore year.

## COLLEGE OF PHARMACY AND ALLIED HEALTH PROFESSIONS UNIFORMS

Students in Respiratory Therapy purchase uniforms in the spring quarter of the freshman year.

Students in Dental Hygiene purchase uniforms in the fall quarter of the freshman year.

Students in Radiologic Technology purchase uniforms in the fall quarter of the freshman year.

Students in the Medical Laboratory Science baccalaureate degree program purchase uniforms in the fall quarter of the junior year. Co-op assignments to hospitals will usually require uniform purchase in the fall quarter of the sophomore year.

## OTHER FEES

### Payment of Tuition

All payments should be made at the Bursar's Office. Checks should be made payable to Northeastern University. Beginning with the second week of any quarter, students are not eligible to attend classes unless their tuition has been paid or specific arrangements have been made with the Bursar for a plan of deferred payment. Deferred payment of tuition entails a fee of two dollars (\$2).

### Late Payment Fee

A fee of 10 dollars (\$10) will be assessed for failure to make or arrange for payments in accordance with the prescribed regulations.

### Laboratory Deposits

Students taking laboratory courses should be prepared to purchase laboratory deposit cards from the Bursar as directed by the department offering the course. These deposits will be charged with deductions for breakage and destruction of apparatus in the laboratory. A charge of five dollars (\$5) each is made for extra cards.

### Reserve Officers' Training Corps—Uniform Deposit

Freshmen enrolling in ROTC make a deposit of 25 dollars (\$25) to cover loss of or damage to ROTC uniform and equipment. Any loss or damage exceeding the deposit will be charged to the student.

### General

*Engineering students* should expect to pay approximately \$50 for drawing instruments and equipment. *Students in the College of Nursing* may expect to be assessed fees for clinical laboratory experiences. *Students in Education* pay a fee of \$586.25 for student teaching. Physical Education majors pay a room and board charge for a resident program at the Warren Center in the Spring Quarter. *Recreation Education* students pay \$170 for the cost of a two-week term of camping at the Warren Center. A one-week session in winter sports is optional for Recreation Education majors in their junior or senior year (at a cost of \$100) and a one-week session in skiing for middlers or juniors in *Physical Education* (at \$100).

A fee of \$8.50 per year is charged for liability insurance for freshmen in certain majors of the College of Nursing and the College of Pharmacy and Allied Health Professions, as well as all upperclass students in these colleges and Boston Bouvé College.

## REFUNDS

The University provides all instruction on an academic quarter basis for which students pay at the beginning of each quarter. Tuition refunds in all schools and colleges are granted through the first four weeks of a quarter only when specific conditions are met and on the basis of the date appearing on the official withdrawal application. (Nonattendance does not constitute official withdrawal.) Questions regarding refunds should be discussed with the Dean of Students' Office. When approved, refunds are made as follows:

### Tuition Refund

Official Withdrawal Filed Within	Percentage of Tuition
1st week of Quarter	100%
2nd week of Quarter	75%
3rd week of Quarter	50%
4th week of Quarter	25%

### Room and Board

Rental charges for rooms in University accommodations are refundable only in cases of withdrawal prior to the start of a quarter (except in special circumstances so adjudged by the University). Board charges are refunded for all unused portions when the food identification card is surrendered to the Office of the Dean of Students for Housing.

### Overloads

Tuition covers the cost of each student's required courses for a quarter. In addition, a course worth one quarter hour of credit may be taken without added charge. However, any other additional courses will be billed as overloads to the students taking them.

## Financial Aid

Financial assistance in the form of loans, grants, and work-study is available on an annual basis to qualified students. Undergraduate financial aid funds are administered in accordance with a nationally established policy and philosophy of financial aid for students pursuing a degree in higher education. It is a basic premise of this policy that parents have an obligation to pay for the education of their children to the extent that they are able to do so. Financial aid is available only for meeting the difference between a student's potential resources, (e.g. parent's contribution, summer or co-op earnings, outside agency awards, etc.), and his/her annual educational costs. The parent's contribution is determined by an objective analysis of the family's financial state: net income, number of dependents, allowable expenses, indebtedness, and assets. Criteria established by the College Scholarship Service are used in making the evaluation.

The University does not award any form of financial assistance to students who are not citizens or permanent residents of the United States.

### Application Procedure

(Freshman Year)

Applicants seeking financial assistance for the freshman year are required to submit a copy of the Financial Aid Form (FAF) to the College Scholarship Service by January 15. This form is available from secondary school guidance offices or the Office of Financial Aid.

In addition to the above form, the applicant must file a Basic Educational Opportunity Grant Application and submit the results of that application to the Office of Financial Aid as soon as possible.

Awards are announced in mid-March for applicants who file before January 15. The awards take the form of a "package," combining scholarship, grant, loan and work-study employment. Awards may be adjusted at any time upon receipt of other funds or changes in financial status.

(See information below concerning State Scholarships and the Federal Basic Educational Opportunity Grant.)

### Application Procedure

(Sophomore—Senior)

Applicants seeking financial assistance are required to submit a PCS or FAF form to the College Scholarship Service each year they apply for assistance. Upperclass applicants are also required to submit one "Upperclass Application for Financial Aid" in each of their upperclass years and file a Basic Educational Opportunity Grant Application and submit the results of that application to the Office of Financial Aid as soon as possible.

Financial aid awards are usually made for the entire academic year, and the application should be filed prior to the following deadlines:

Fall	April 15
Winter	August 15
Spring	November 15
Summer	January 15

(See information below concerning State Scholarships and the Federal Basic Educational Opportunity Grant.)

## STATE SCHOLARSHIP PROGRAMS

**The Office of Financial Aid strongly advises aid applicants to apply to state scholarship programs at the same time that they apply for aid from the University.**

The Commonwealth of Massachusetts provides scholarship aid to Massachusetts students pursuing full-time day programs of study in an accredited college or university. Awards are made in the summer of each year, and applications for entering freshmen are available through their high school guidance office. Out-of-state students should investigate aid programs in their respective states also. Substantial state aid is offered by Connecticut, New Jersey, Pennsylvania and Rhode Island.

## FEDERAL PROGRAMS

Please note that aid granted from programs funded by the federal Government is dependent upon the amount of funds allocated to Northeastern University.

### Basic Educational Opportunity Grant

This is a program of direct federal grants to college students. An eligible student could receive as much as \$1,400 per year towards his/her cost of education. Basic Grants are available to all students who have not previously received a bachelor's degree and who are not in this country on a student visa and are attending on at least a half-time basis. To utilize this program to the fullest as a base for your financial aid package, all students applying for aid must have evidence of application to this program. Applications for the B.E.O.G. Program are available at your local high school, public library, and other locations easily accessible to students. If unavailable at these locations, write to Basic Grants, P.O. Box 84, Washington, D.C. 20044.

### College Work-Study Program

This is a program of part-time employment under the sponsorship of the federal government. It is designed to help full-time undergraduate students meet their educational expenses. Students may work part-time while attending classes up to twenty hours per week. Eligible students may work for the University or for public or private non-profit off-campus agencies. The Office of Financial Aid has the responsibility of placing qualified students in their job assignments.

### Supplementary Educational Opportunity Grant

This is a program of direct awards sponsored by the Federal Government. They are available to a limited number of full-time undergraduate students who show evidence of having exceptional financial need and academic promise. Eligible students who are accepted for entrance may receive Educational Opportunity Grants ranging from \$200 to \$1,500 for each year of undergraduate education up to a maximum period of four years or its equivalent. The Federal government requires that an Educational Opportunity Grant (E.O.G.) be matched by a grant, loan or part-time employment which must be accepted by the student, if the E.O.G. portion of the award is to stand. Aid over and above the matching portion may be accepted or declined at the discretion of the recipient.

### Guaranteed Student Loan Program

Under this program, students who are matriculated degree candidates, enrolled for at least one-half the normal academic work load, may borrow from a participating bank or other financial institution. Terms and conditions vary from state to state, but a student generally may borrow up to \$2,000 a year (the law allows a maximum of \$2,500 per year) depending on financial need. The federal Government pays the interest while the student is in school if the student is eligible for interest subsidy.

Applications for the loan itself are available from local banks or the Education Office of your state government. Additional information and necessary application forms for Massachusetts residents are available from the Financial Aid Office.

**Health Professions Loan**

This program is available to full-time undergraduate students who have been accepted for a course of study leading to a Bachelor of Science degree in Pharmacy. A student who evidences financial need and academic promise may borrow as much as \$2,500 per academic year. Repayment of principal and interest does not begin until one year after the student ceases to pursue a full-time course of study. Repayment of principal may be extended over a 10-year period with interest at the rate of 3% per annum.

**Law Enforcement Loan**

This program is available to full-time students in a course of study leading to a Bachelor of Science degree in an area directly related to law enforcement. The applicant must evidence financial need and intend to pursue full-time employment in a law enforcement agency of a state or local government upon completion of his studies. The maximum loan is \$2,200 per academic year with no repayment of principal or interest beginning until six months after the student ceases to pursue a full-time course of study. Repayment of principal may be extended over a 10-year period with the interest at the rate of 7% per annum. Repayment may be deferred up to a maximum of four years while a borrower is serving in the Armed Forces.

Cancellation of up to 100% of the loan at the rate of 25% per annum may be allowed for each complete year of full-time employment in a public law enforcement agency.

**National Direct Student Loan**

This program is available to students who show evidence of financial need. Undergraduate students may borrow as much as \$1,500 each academic year up to a maximum of \$5,000 for their entire undergraduate education. Repayment and interest on these loans do not begin until nine months after the student ceases to carry at least a half-time academic load at an institution of higher education. The repayment of principal may be extended over a ten-year period with the interest at the rate of 3% per annum. Repayment may be deferred up to a total of three years while a borrower is serving as a Peace Corps or VISTA volunteer.

Borrowers who elect to teach the disadvantaged or handicapped may qualify for cancellation of their entire obligation over a seven-year period. Borrowers serving as full-time members of the Armed Services of the United States are entitled to cancel 12½% per annum of the principal outstanding on any loans for each year of such service up to a maximum cancellation of 25%.

**Nursing Student Loan**

This program is designed for full-time undergraduate students who have been accepted for a course of study leading to an Associate or Bachelor of Science degree in Nursing. Providing financial need is evident, a student may borrow as much as \$1,500 each year up to a maximum amount of \$6,000 for his/her entire undergraduate education. Repayment and interest on these loans do not begin until nine months after the student ceases to pursue a full-time course of study. The repayment of the principal may be extended over a 10-year period with the interest at the rate of 3% per annum.

Cancellation of up to 50% of the loan at the rate of 10% per year may be allowed for borrowers employed as professional nurses in any public (private) non-profit institution in an area having a substantial shortage of nurses.

**ROTC Scholarships**

(Refer to section on Reserve Officers' Training Corps.)

**Students should not apply for any specific scholarship. The University will award the particular scholarship to the student who qualifies for it.**

## SCHOLARSHIPS FOR FRESHMEN

### Alumni Scholarships All Colleges

Scholarship aid is available to entering freshmen who are relatives of alumni. Applicants must show evidence of scholastic achievement and financial need.

### Henry B. Alvord Memorial Scholarships in Civil Engineering Engineering

Established in 1940 in memory of the late Henry B. Alvord, Professor of Civil Engineering and Chairman of the Department for 18 years, the award is made annually to a student graduating from an accredited secondary school who demonstrates superior academic ability and gives promise of succeeding in civil engineering. The grant of \$250 is made only to an entering freshman who is qualified for and plans to study civil engineering.

**Armstrong Rubber Company  
Scholarships** All Colleges

Established in 1960, the Armstrong Rubber Company of West Haven, Connecticut, offers annually a scholarship in the amount of \$1,800, to a qualified boy or girl admitted to the University for a full-time program of study. Although children of Armstrong Company employees are given preference, any student residing in New Haven County is eligible to apply.

Recipients of the scholarship will participate in the University's cooperative program and will be expected to spend at least four periods of student employment with the firm. Scholarship applications are available from the Company upon request and should be returned to the Personnel Office no later than April 30 of the year in which the student plans to enter the University.

**Badger Company, Inc., Grant  
Program** Engineering

The Badger Company, Inc., has made available to Northeastern University two grants of \$1,200 each to be given to first-year students. Recipients must be from secondary schools in the Greater Boston area and have been accepted into the College of Engineering. Summer employment shall be available to the recipient(s) of the grant during the summer before their matriculation at the University; and cooperative work will be offered as long as positions are available during their undergraduate years.

**George L. Barnes Scholarship**  
All Colleges

This fund was established in 1969 by Miriam P. Poole, daughter of George L. Barnes, in memory of her father, a distinguished member of the Northeastern University Corporation and Board of Trustees from 1937 until his death in 1965.

The income from this fund will provide a full scholarship annually to some deserving student from Weymouth, Massachusetts. The award is made on the basis of need and character. Some additional assistance may be given in the upper-class years.

**The Barry Scholarship**  
Engineering

The Barry Scholarship, established in 1973 by the Barry Division of Barry Wright Corporation, is available to students in the College of Engineering. Preference will be given to mechanical engineering majors and sons and daughters of Barry employees, based upon demonstrable financial need and academic achievement.

**The Godfrey L. Cabot Scholarship  
Fund** All Colleges

This fund was established by Dr. Cabot in 1954 to help meet the college expenses of employees or children of employees of Godfrey L. Cabot, Inc., and its subsidiary and associated companies. To be eligible, the employee must have completed at least five years of service to the company prior to the time the student enters the University. The University shall determine the number and amount of these scholarships, which are not limited to outstanding students and which are available to evening as well as day students. Students interested in applying for scholarship aid from this fund should communicate with the Cabot Personnel Office or the Office of Financial Aid at Northeastern University.

**The Gardner A. Caverly  
Scholarship** All Colleges

This scholarship was established in 1957 through the generosity of Mr. Gardner A. Caverly, an alumnus of the College of Business Administration and a member of the Class of 1934. Its purpose is to provide financial assistance and encourage qualified students from the New England area to attend Northeastern University. In selecting worthy students for these scholarship awards, preference is given to graduates of the Rutland, Vermont, and Laconia, New Hampshire high schools.

**Community Scholarships**  
All Colleges

The Community Scholarships were established by President Asa S. Knowles during the period 1963-1973. These scholarships stipulate that Northeastern will provide full freshman tuition for qualified students from the following communities:

Boston — three scholarships at each of the seven high schools; Ashland — three scholarships; Burlington — three scholarships; Weston — three

scholarships; Framingham — two scholarships; Weymouth — two scholarships; Haverhill — two scholarships; Lynn — two scholarships; Norwood — two scholarships, and Brookline — three scholarships.

**The Cotrell Company Engineering  
Scholarship Engineering**

In 1961, the Cotrell Company of Westerly, Rhode Island, established an annual scholarship of \$1,000 to be awarded to a senior in the upper fourth of his class attending a high school in the Westerly area or to a senior in any high school who is the son of an employee of The Cotrell Company. Selection preference will be given to sons of employees and to students who have a long-range interest in the specialized fields of mechanical, electrical, and industrial engineering.

**Carl W. Christlansen Scholarship  
Business Administration**

The Carl W. Christiansen Scholarship Fund was established in 1976 by Mr. Carl W. Christiansen, a graduate of the School of Commerce and Finance, Providence Division of Northeastern University, Class of 1923. Early in his career, Mr. Christiansen was an accounting instructor and associate dean in the Providence Division. In 1927, the accounting firm of Christiansen, Murphy and Company was founded, and in 1940, it became known as Christiansen and Company-Certified Public Accountants. The income from this fund is to be awarded annually to an entering freshman in the day College of Business Administration who has demonstrated the necessity for financial aid. Preference will be given to students from the state of Rhode Island interested in pursuing a career in accounting.

**The William O. DiPietro  
Scholarship Engineering**

This scholarship was established in 1967 through the generosity of Mr. William O. DiPietro, a distinguished alumnus of the College of Engineering and a member of the Class of 1942. The scholarship is awarded annually to one or more deserving freshmen who demonstrate a high caliber of achievement and a desire to fulfill the limits of their ability in both academic and cooperative periods of study. In considering recipients for this scholarship, preference will be given to freshmen enrolled in the College of Engineering who have a desire to major in Chemical Engineering. It is intended that those students receiving awards from this scholarship might someday contribute to this or other scholarships themselves, thereby perpetuating growing funds that will help other deserving individuals.

**The Harry Doehla Memorial  
Scholarship All Colleges**

The Harry Doehla Memorial Scholarship was established in 1974 in memory of Mr. Harry Doehla, founder and president of Doehla Greeting Cards, Inc. During his lifetime Mr. Doehla provided much financial assistance to young people of limited means to help them in furthering their educational goals.

The awards from this fund are available to undergraduate day students with preference being given to graduates of Fitchburg High School, Fitchburg, Massachusetts, and Nashua High School, Nashua, New Hampshire. Additional consideration will be given to children of employees of Doehla Greeting Cards, Inc.

**Carl Stephens Ell Alumni  
Scholarships All Colleges**

To honor Dr. Carl Stephens Ell, the second president of Northeastern University, the Alumni Association established these scholarships in 1958. Either freshmen or upperclassmen enrolled at the University are eligible. Awards will be made to worthy students on the basis of scholastic ability and need. The scholarships are to be distributed as equitably as possible among students in the Basic Colleges and University College. Preference shall be given to sons and daughters of Northeastern Alumni.

**The George Raymond Fennell  
Memorial Scholarships  
Business Administration**

Two full-tuition scholarships are awarded each year to first-year students enrolled in the College of Business Administration. The scholarships are awarded in memory of George Raymond Fennell, formerly Assistant Director of Admissions and Director of the Northeastern Student Union.



**The Nathan Gerber Memorial  
Scholarship** All Colleges

The Nathan Gerber Memorial Scholarship was established in 1974 by Albert Gerber E52 and Robert Gerber E60 in memory of their father, Nathan, a member of the Class of 1925. The scholarship is to be awarded annually to a student or students enrolled in the freshman class with a demonstrable financial need. Selection is made by the Committee on Scholarships.

**Charles Hayden Memorial  
Scholarships** All Colleges

The Charles Hayden Foundation, created by the will of the late Charles Hayden, an alumnus of the Boston English High School, offers annual memorial scholarships to freshmen at Northeastern University. The scholarships are awarded to "deserving boys" whose parents are unable to finance the entire cost of their education.

**The Edward L. Hurtig  
Scholarships** All Colleges

This scholarship was established in 1968 through the generosity of the Hurtig family in memory of Edward L. Hurtig, an alumnus of the College of Engineering, Class of 1946. The scholarship is awarded annually to an entering freshman in the day colleges who has demonstrated the necessity for financial aid. Preferences will be given to recipients of the Educational Opportunity Grants Scholarship Program of the United States Office of Education.

**The Maurice A. and Nellie L.  
Idelson Award** All Colleges

This award, established in 1968, is given annually to an entering freshman in the day colleges who has demonstrated the need for financial aid. Preference will be given to graduates of the Boston English High School. Should there be no qualified candidate from this source, the award will then be given to any worthy student.

**The Martin Luther King, Jr.  
Scholarship**

The Martin Luther King, Jr. Scholarship is granted annually to incoming freshmen, graduate, and transfer minority students who have demonstrated the philosophy of peaceful co-existence and change through nonviolent means espoused by Dr. King, and who have an above average scholastic record. The scholarship, in the amount of \$500, requires a minimum grade point average and, based on other criteria, is renewable. Financial aid based on need is available to supplement the scholarship.

**Merchants Tire Company  
Scholarships Fund**

Business Administration

This scholarship was established in 1972 by Merchants Tire Company in honor of Max Katz, a Class of 1917 alumnus of Northeastern and founder and chairman of the board of Merchants Tire Company. The scholarship is awarded annually with selection preference given to a son or a daughter of a current employee of Merchants Tire Company, who is enrolled as a freshman within the College of Business Administration and demonstrates financial need, soundness of character and academic stability.

**Power Systems Engineering  
Grants-in-Aid**

Electrical Engineering

A number of public utilities and power equipment manufacturing companies in the northeastern part of the United States have made available grants-in-aid ranging from \$1,000 to \$1,800 to assist able freshmen who are planning to undertake the six-year integrated cooperative program in power systems engineering leading to the degrees of Bachelor of Science and Master of Science in Electrical Engineering. These awards are made on the basis of academic achievement in high school and aptitude for and interest in the field of power systems engineering, without regard to financial need.

Candidates for such grants-in-aid should apply to the Dean of Admissions at Northeastern University not later than March 1 of the year in which they wish to enter the College of Engineering.

**Regional Scholarships**  
All Colleges

Secondary school students who reside in rural areas of New England, who have demonstrated superior achievement in their studies, and who are strongly endorsed by their principals and guidance counselors, may qualify for a Regional Scholarship. Scholarships range from \$200-\$1,400.

**Reserve Officers' Training  
Corps Scholarship Program**

(Refer to section on Reserve Officers' Training Corps.)

**Clinton H. Scovell  
Scholarships** Boston-Bouve

Scholarships are made available annually to men and women students in Boston-Bouvé College through a fund provided by the will of Clinton H. Scovell.

**The Sidney L. Sholley  
Memorial Scholarships**  
All Colleges

The Sidney L. Sholley Memorial Scholarships have been established by the Trustees of the Keystone Charitable Foundation in memory of Mr. Sidney L. Sholley, founder and first president of the Keystone group of mutual funds. Two scholarships of \$600 each will be awarded annually to incoming freshmen. Recipients of the scholarships will be known as the Sidney L. Sholley Scholars.

**Spofford Scholarship Fund**  
All Colleges

The Spofford Scholarship is awarded annually to an American Negro, American Indian, or multi-racial freshman who demonstrates severe financial need.

**Trustee Scholarships**  
All Colleges

Established in 1928 by the Board of Trustees of Northeastern University, these full- and partial-tuition scholarships are granted in the Basic Colleges each year to entering freshmen who have demonstrated superior scholastic attainment throughout their preparatory or high school courses.

**Western Electric Scholarships**  
Engineering

In 1973, Western Electric provided Northeastern University with a generous five-year grant, one-half of which is restricted for use as scholarship aid to first-year students admitted to or enrolled in the College of Engineering who demonstrate financial need and soundness of character. Western Electric Scholarships will be awarded through the academic year 1977-1978.

## SCHOLARSHIPS FOR UPPERCLASSMEN

**Dr. Martin E. Adamo  
Scholarship** Pharmacy

This scholarship of \$100 is given annually by the Boston Association of Retail Druggists in memory of Dr. Martin E. Adamo, the second president of the New England College of Pharmacy.

**The Vivian B. Allen  
Scholarships** Nursing

The Vivian B. Allen Foundation Endowment for nursing scholarships was established in 1968 through the generosity of the Vivian B. Allen Foundation, Inc. The income from a \$500,000 endowment fund is to be used to provide scholarship assistance for students entering or enrolled in the College of Nursing of Northeastern University. The application procedures and qualifications for selection are the same as those for all other scholarships.

**American Foundation for  
Pharmaceutical Education  
Scholarships** Pharmacy

The Board of Grants of the American Foundation for Pharmaceutical Education provides three scholarships of \$200 each to be awarded to junior or senior students on the basis of scholarship and financial need with the understanding that the University will match the awards to the students selected. The use of the funds is restricted to the payment of tuition and laboratory fees.

**The Boston Section of the  
American Society for Quality  
Control Scholarship** All Colleges

This annual award was established in 1961 by the Boston Section of the American Society for Quality Control to provide assistance to a student enrolled in a collegiate program which will prepare him for a constructive career in the broad field of quality control. The recipient must have completed his second year; and in his education or work experience, he must have demonstrated an interest in the broad field of quality control.

The Boston Section has an extensive educational program for those whose work requires an increasing knowledge of quality control, and it is active in enhancing the standards in this field.

**The Henry Francis Barrows Scholarships** All Colleges

Established in 1949, the four Henry Francis Barrows Scholarships provided under the will of Fanny B. Reed are offered to Protestant young men, born and brought up in New England. Good scholastic standing, good character, and need must be demonstrated by recipients of the scholarships.

**The Mr. and Mrs. Emil Matthew Bauer Fund**  
All Colleges

The interest from the Fund, established in 1954, is used for scholarships or other financial assistance to students of German birth or of German extraction studying at Northeastern University. The scholarships are available to either men or women students enrolled in any year at the University.

**Board of Higher Education Scholarships** All Colleges

This program was established in 1957 by the Commonwealth of Massachusetts to provide scholarship aid to Massachusetts students pursuing full-time day schedules in accredited colleges. Awards are made in the fall of each year, and applications for upper-class students are available during April in the Office of the Director of Financial Aid for Students.

**The Boston Paper Trades Association, Inc., Scholarship**  
Business Administration

Established in 1966 by the Boston Paper Trades Association, Inc., this is an annual scholarship awarded to a junior or senior who has demonstrated by his cooperative work achievement and his extracurricular activities an interest and potential in the field of sales. The recipient must be of high character, have a good academic record, and be able to demonstrate financial need.

**The Boston Rubber Group Scholarship**  
Chemistry, Chemical Engineering

This scholarship, established in 1962, is to be awarded, in whole or in part to one or more chemistry or chemical engineering cooperative students on the basis of merit, need, scholarship, and personal qualifications. The Boston Rubber Group Scholarship is sponsored by the Division of Rubber Chemistry, American Chemical Society.

**Boston Society of Civil Engineers Scholarship in Memory of Desmond FitzGerald** Civil Engineering

In 1931, the Boston Society of Civil Engineers established a scholarship in memory of Desmond FitzGerald, a former president of the Society and an eminent hydraulic engineer with a distinguished record of service.

It has been awarded annually since 1931 to an outstanding Northeastern University senior or junior student in the Department of Civil Engineering of the College of Engineering. The presentation is made by the President of the Boston Society of Civil Engineers at the Society's annual meeting in the spring of the year.

**Martin Brown Scholarship Fund** Engineering

This scholarship was established in 1961 by Mr. Martin Brown, an engineering alumnus of the Class of 1921. Its purpose is to assist qualified students enrolled in the College of Engineering who have need and have demonstrated above-average scholastic ability.

**Wellington Burnham Fund**  
All Colleges

This fund provides financial assistance to worthy students of limited means without discrimination as to race, creed, color, or scholastic attainment. It was established in 1961 under the provisions of the will of George A. Burnham.

**The Camp, Dresser and McKee Scholarship** All Colleges

This Scholarship was established in 1973 by Camp, Dresser and McKee, Inc. and is available to students in all colleges. Preference will be given based upon demonstrable financial need and academic achievement.

**Louis S. Cashman Memorial  
Scholarship Fund**  
Business Administration

Established by the Massachusetts CUNA Credit Union Association and friends of Mr. Cashman in recognition of his outstanding service to the credit union movement in the Commonwealth.

This scholarship is awarded annually to students in the College of Business Administration who have need with particular preference given to those enrolled in Banking and Finance.

**The William M. Cavanaugh  
Memorial Scholarship**  
All Colleges

This award, established by the members of the Publicity Club of Boston, is open to men and women of the junior and senior classes who demonstrate talent in the field of communications. The scholarship of \$100 bears the name of the second president of the Publicity Club (1950-1951) who was an able and successful newspaper man.

**Chemical Club of New England**  
Chemistry, Chemical Engineering

To promote interest in the chemical engineering field in New England, the Chemical Club of New England has made generous scholarships available to junior and senior students who are majoring in chemistry or chemical engineering and who show promise of success in either field.

Recipients of these scholarships must be residents of New England and have financial need, above-average grades, and a good cooperative work record.

**Civil Engineering Department  
Award** Civil Engineering

The Civil Engineering Department Award was established by members of that department to recognize achievement and give financial assistance to a student who has elected a major in the field of civil engineering. This award, in the amount of \$100, is financed by gifts from members of the Civil Engineering Department and is awarded to the recipient at the beginning of his/her sophomore year.

**Ruby H. Cole Scholarship  
Fund** All Colleges

The Ruby H. Cole Scholarship Fund was established in 1973 under the Will of Mrs. Cole, late of Boston, Massachusetts. The income from the fund is awarded annually to one or more female students enrolled in or admitted to undergraduate programs of the Basic Colleges of the University and who are graduates of Girls High School, Roxbury, Massachusetts. Recipients must demonstrate financial need, academic stability and soundness of character.

**The Compugraphic Corporation  
Scholarship Fund** All Colleges

The Compugraphic Corporation Scholarship Fund has been established and endowed at the University with a generous gift from an individual. The income from the scholarship fund is to be used annually as financial assistance for persons who are admitted to or enrolled in full-time undergraduate programs of the Basic Colleges of the University and who demonstrate financial need, academic stability and soundness of character. Scholarships will be tuition grants and will be awarded to persons who are otherwise eligible and who are, at the time of the grant, children of current employees of Compugraphic Corporation.

**Connecticut Alumni Rudolf O.  
Oberg Scholarships**

Each year the Connecticut Alumni Club awards scholarships to students from the State of Connecticut who have achieved a high academic average in their freshman year and have demonstrated financial need. The scholarships are to be used toward the tuition expense of the sophomore year. These scholarships were established in 1958 to promote Northeastern University among the preparatory schools of Connecticut and, in 1971, were named to honor Rudolf O. Oberg, the former Director of Alumni Relations.

**John W. Dargavel Foundation  
Scholarship** Pharmacy

This scholarship was established in 1964 by the John W. Dargavel Foundation, sponsored by the National Association of Retail Druggists. The award is limited to students who have completed their sophomore year in the College of Pharmacy and Allied Health Professions.

**Charles M. Devlin****Scholarship** All Colleges

This fund was established in 1976 by the members of the Class of 1970 "in honor of our dedicated adviser," Charles M. Devlin. The income from the Fund, will be awarded annually to upperclassmen with proven ability and demonstrable financial need. Preference will be given to children of members of the Class of 1970.

**The Diamond Anniversary  
Development Program****Scholarship** All Colleges

This scholarship has been established to commemorate the successful conclusion of the Diamond Anniversary Development Program. This Scholarship Fund recognizes the loyalty and generosity of the thousands of alumni and friends, corporations, foundations, and organizations whose significant contributions of time and resources have brought Northeastern University to "that greatness which is its destiny."

Three \$1,000 scholarships will be awarded annually, as follows: to one or more full-time students enrolled in a cooperative education program within a basic college of the University; to one or more part-time students enrolled in a basic college of the University; and to one or more full-time students enrolled in the graduate division or a professional school of the University. Consideration will be based upon financial need, academic stability, and soundness of character.

**The Cpl. James B. Downey USMC****Scholarship Fund** All Colleges

This scholarship was established in 1970 through the generosity of Mr. William J. Downey, a graduate of the College of Liberal Arts, Class of 1952, in memory of his brother, Cpl. James B. Downey USMC. The scholarship is to be awarded annually to an upperclassman in the day colleges who has demonstrated the necessity for financial aid.

**Luis de Flores Endowment****Fund** All Colleges

This fund was established in 1964 to provide yearly awards to students in recognition of superior ingenuity, irrespective of general academic standing.

**Agnes F. Driscoll Scholarship****Fund** All Colleges

This fund will provide scholarship assistance to students in their upper-class years who have demonstrated financial need and scholastic attainment.

**Electrical Manufacturers  
Representatives Club of New  
England, Inc., Scholarship****Electrical Engineering**

Established in 1958, this scholarship of \$475 is granted to a student or students majoring in electrical engineering, without regard to race, creed, or color. To qualify, students must have real financial need and excellent scholastic standing.

**Carl Stephens Ell Alumni****Scholarships**

(For description of this scholarship, see page 192.)

**Elmer H. and Daisy M. Everett  
Memorial Scholarship****All Colleges**

This Scholarship was established through a bequest of Elmer H. and Daisy M. Everett, both alumni of Northeastern University. Mr. Everett graduated from the College of Engineering and Mrs. Everett graduated from the School of Business. They are both members of the Class of 1934. Mr. and Mrs. Everett had the strong conviction to help young people wanting to further their education. The fund will be administered by the Office of Financial Aid.

**Clara and Joseph F. Ford****Scholarship Fund** All Colleges

A fund established by Clara and Joseph F. Ford to provide tuition scholarships for worthy, needy, and well-qualified students who have demonstrated a democratic and tolerant spirit and who are well disposed toward people of all creeds and races.

**Gilman Brothers Inc.  
Scholarship** Pharmacy

This scholarship of \$250 is given annually by Gilman Brothers, Inc. to help a student further his education in pharmacy.

**The Foster Grant Scholarship**

All Colleges

This scholarship, established in 1974 by the Foster Grant Co., Inc. of Leominster, Massachusetts, is available to students in any of the full-time undergraduate colleges. Preference will be given to children of employees of Foster Grant Co., Inc. Basis for the award will be demonstrable financial need and above-average academic achievement.

**Clifton W. Gregg Memorial Scholarship**

All Colleges

This scholarship was established through a bequest of Clifton W. Gregg, a 1915 graduate of the School of Commerce and Finance of Northeastern University. It was Mr. Gregg's request that "the income from this fund be used for the assistance of financially needy students." The award may be made annually. Recipients will be determined by the Committee on Scholarships.

**Rabbi Myer O. Grunberg Scholarship**

All Colleges

Established in 1953 by Mrs. Myer O. and Miss Rose Grunberg, this annual award is available to a senior student in any college of the University. The award is made to that man or woman student who has evidenced in personal, business, and student relations those characteristics of leadership and human relations which make for a better social order. There is no restriction as to race, creed, color or sex.

**The Walter F. Howe Memorial Scholarship**

Business Administration

This fund was established in memory of Walter F. Howe, Class of 1968, who within one week after graduation was fatally wounded living up to his ideals of good citizenship and civic responsibility. Walter was tragically slain while pursuing thieves who had stolen his landlord's car. The scholarship was established through the generosity of Walter's friends and relatives and is awarded annually to a student in the College of Business Administration who demonstrates not only financial need but good citizenship and civic responsibility. The scholarship is open-ended so that additional sums can be added to it in future years and will be awarded by the University without restrictions as to race, color, geographic origin, or scholastic attainment.

**Joseph Anthony Johnson Scholarships**

Engineering

Established in 1968 by the will of the late Joseph Anthony (Johansen) Johnson of the Class of 1928, the income provides scholarship aid for students enrolled in the Department of Mechanical Engineering, with preference given to students of Scandinavian origin.

**Dr. LeRoy C. Keagle Memorial Scholarships Fund**

Pharmacy

The Dr. LeRoy C. Keagle Memorial Scholarship Fund was established in 1975 through the generosity of family and friends of Dr. LeRoy C. Keagle, a man of high integrity and commitment to the profession of pharmacy who, at the time of his death on December 15, 1974, was Dean of the College of Pharmacy and Allied Health Professions at Northeastern University. The income from this Scholarship Fund is awarded annually to a student in the undergraduate Pharmacy Program who is entering the junior or senior class. Recipients must demonstrate financial need, academic stability, and soundness of character.

**Vena Morse Lamson Scholarships**

All Colleges

These scholarships are provided through the income of a fund established in 1963 by Horatio W. Lamson in memory of his beloved wife. They are awarded annually to needy and worthy students who are enrolled in any of the Basic Colleges of the University. The Scholarships are granted by the Committee on Financial Aid of the University without regard to national origin, sex, race, or creed.

**The Irving Landfield Scholarship**

All Colleges

This fund was established in 1972 through the generosity of Irving Landfield, a graduate of the School of Commerce and Finance of Northeastern University, Class of 1923. The income from the fund is to be awarded annually to help deserving and needy students who demonstrate a desire to fulfill the limits of their ability in academic and cooperative periods of study. The income from this fund will be administered and awarded by the University without restriction as to race, color, creed, geographic origin, or scholastic attainment. It is Mr.

Landfield's desire that recipients of the scholarship assume a moral obligation to contribute to the principal of this fund as they may be able, in order to make additional financial aid available for other students in later years.

**Avrom Aaron Leve Memorial  
Scholarship** Psychology

This scholarship fund was established in 1957 in memory of Dr. Avrom Aaron Leve, former Assistant Professor of Psychology. The interest is used annually to provide scholarships for upper-class students majoring in psychology. The award is made on the basis of academic achievement, financial need, and character.

**Russell T. Lowe Memorial  
Scholarship Fund**  
College of Engineering

This fund was established in 1976 in memory of Russell T. Lowe, a graduate of the College of Engineering, Class of 1953. The endowment funds were provided by the friends and associates of Russell Lowe and the Barry Wright Corporation, where he served as a member of the Board of Directors and as President of the Industrial and Aero Products Group. The income from the fund will be awarded annually to one or more upperclass students enrolled in the College of Engineering. Preference will be given to Mechanical Engineering majors based upon demonstrable financial need and above average scholastic achievement.

**Dr. Reuben J. Margolin Memorial  
Scholarship Fund** Education

The Dr. Reuben J. Margolin Memorial Scholarship Fund was established in 1973 through the generosity of family and friends of Dr. Reuben J. Margolin, an outstanding and dedicated individual and friend who, at the time of his death on April 6, 1972, was Chairman of the Department of Rehabilitation and Special Education at Northeastern University.

The income from the Dr. Reuben J. Margolin Memorial Scholarship Fund is awarded annually to a deserving student admitted to or enrolled in the College of Education or the Graduate School of Education and majoring in Rehabilitation and/or Special Education. Recipients must demonstrate financial need as well as the personal and professional qualities exemplified by Dr. Margolin.

**George T. Marvin Scholarship  
Fund** All Colleges

This fund was established in 1961 under the provisions of the will of George T. Marvin, a graduate of the Northeastern University School of Law, Class of 1918. Mr. Marvin designated that the income of this fund should be used to provide financial assistance to worthy and needy students to assist them in furthering their education at Northeastern University.

George T. Marvin Scholarships may be awarded to new students seeking admission to Northeastern and to students enrolled as freshmen and upper-classmen. Applicants must have satisfactory records of scholarship as of the time of making application and must demonstrate genuine need and good citizenship.

**Massachusetts State  
Pharmaceutical Association  
Scholarship** Pharmacy

This scholarship of \$200 established by the Massachusetts State Pharmaceutical Association is awarded annually. The recipient must be a resident of Massachusetts.

The Massachusetts State Pharmaceutical Association also awards a number of scholarships of \$100. Applications for these scholarships may be secured from the office of the Association at 11 Beacon Street, Boston.

**Frederick W. Muckenhaupt  
Scholarship** All Colleges

This award was established in 1961 by Dr. and Mrs. Carl F. Muckenhaupt in memory of their son, Frederick W. Muckenhaupt, Class of 1959 of the College of Engineering.

The award is to be made annually to a student in good standing on the basis of need. Preference is given to a student enrolled in the Department of Electrical Engineering.

**Elizabeth A. Neilson  
Scholarship** Boston-Bouvé

The Elizabeth A. Neilson Scholarship Fund was established in 1976 in memory of William H. and Anastasia Neilson, exemplars of the profession of health edu-

cation during their lifetimes. The income from the scholarship fund is awarded annually to a student majoring in health education who has completed at least one full year as a degree candidate in Boston-Bouvé College. The student must demonstrate financial need and scholastic achievement and must typify the philosophy of the health education profession.

**The New England Paper  
Merchants, Inc., Scholarship**  
All Colleges

Established in 1959 by the New England Paper Merchants Association, Inc., this is an annual scholarship awarded to a junior or senior who has demonstrated by his cooperative work achievement and his extracurricular activities an interest and potential in the field of sales. The recipient must be of high character, be able to demonstrate financial need, and have a good academic record.

**Norfolk County Pharmaceutical  
Association Scholarship**  
Pharmacy

This scholarship of \$50 is awarded annually to a student who meets the requirements both financially and scholastically and is a resident of one of the member towns covered by the Norfolk County Pharmaceutical Association (Norwood, Dedham, Canton, Walpole, Millis, Needham, Westwood, and Islington).

**Pilot Freight Carriers Scholarship**  
Business Administration

The Pilot Freight Carriers Scholarship is awarded annually to an upperclass student of Business Administration who has achieved an outstanding academic record and who is interested in a career in the field of transportation. The amount of this award is \$500.

**The Mildred A. Reardon  
Scholarship Award** All Colleges

Delta Pi Alpha Sorority sponsors an annual award of \$100 to a deserving coed in the Basic Colleges. Selection is made by the Dean of Women on the basis of financial need and academic standing. The award is given in honor of an outstanding alumna of Northeastern and Delta Pi Alpha, whose academic excellence, strength of character, and qualities of leadership have typified the ideal for which the sorority strives.

**The Gay Miller Reese Memorial  
Scholarship** Boston-Bouvé College

The Gay Miller Reese Memorial Scholarship was established in 1971 by Everett Reese, in memory of his wife, and by members of the Class of 1921 at their 50th Reunion in honor of their classmate and Class President, Gay Miller Reese. This scholarship is to be awarded annually to help a well-qualified upper-classman in Boston-Bouvé College acquire the education he or she could not otherwise afford. The recipient of this award will be selected by the Committee on Scholarships.

**The Myer Riesman Scholarship**  
Nursing

This fund, established in 1969 in memory of Myer Riesman, is used to provide financial assistance to deserving students in the College of Nursing. Preference is given to those students whose clinical experience is at Beth Israel Hospital.

**Frank B. Sanborn  
Scholarship Fund** Engineering

The Frank B. Sanborn Scholarship Fund was established in 1958 to provide a scholarship or scholarships of not more than \$500 to worthy and needy students selected by the University, without restrictions as to race, creed, or geographic origin, but with preference being given to students majoring in electrical, mechanical, civil, or industrial engineering, in the order stated.

Each recipient must be willing to assume a moral obligation to reimburse the fund as he may be able, to make similar financial aid available for other students in later years. There shall be no interest charged and no time specified for reimbursement.

**Clinton H. Scovell  
Scholarships** Boston-Bouvé

Scholarships are made available annually to students in Boston-Bouvé College through a fund provided by the will of Clinton H. Scovell.



**John Stuart Sousa, Jr. Memorial  
Scholarship Fund Pharmacy**

This scholarship was established in 1968 in memory of John S. Sousa, Jr., of Fall River, Massachusetts, a student in the College of Pharmacy, Class of 1969, by his family and friends. The scholarship is awarded annually with selection preference given to a male student entering his senior year in the College of Pharmacy and Allied Health Professions who has obtained a cumulative quality point average of 2.300, demonstrates financial need, participates in extracurricular activities and is preferably a member of a fraternity.

**William Lincoln Smith Scholarship  
Fund Electrical Engineering**

The fund was established in 1947 by Farnham Wheeler Smith, Class of 1924, Benjamin Lincoln Smith, Class of 1923, Thomas Hollis, Jr., Class of 1941, and other members of the family in honor of Dr. William Lincoln Smith, who served long, faithfully, and with distinction as Chairman of the Department of Electrical Engineering at Northeastern University.

The income from the fund is used for an annual scholarship award to a student enrolled in the Department of Electrical Engineering who has demonstrated excellence in some aspect of electrical research, stands high in his courses, or otherwise exhibits promise of future competence in the field. The award shall preferably be granted to a student who needs financial assistance to continue his college work.

**George A. and Lorraine  
C. Snell Scholarship  
All Colleges**

This fund was established in 1973 by Mr. George A. Snell, a graduate of the College of Engineering, Class of 1941, and a member of the Northeastern University Corporation and Board of Trustees, and his wife Lorraine C. Snell.

The income from the fund is to be awarded annually to one or more students enrolled in the basic colleges of Northeastern University. Selection will be made by the Committee on Scholarships based upon those candidates who demonstrate financial need, academic stability, and soundness of character.

**Professor Joseph Spear Fund  
for Excellence in Student Activities  
Engineering**

This fund was established by the Class of 1923, College of Engineering, in recognition of Professor Spear, their class adviser and mentor. It was through Professor Spear's devotion and concern for the well-being of the students that he developed and promoted student activities at Northeastern University. Professor Spear has been referred to as the "Father of Student Activities." The purpose of this fund is to provide a source of income that can be awarded annually to juniors and seniors of the Day College of Engineering who have made outstanding contributions to student activities.

**South Middlesex Pharmaceutical  
Association Pharmacy**

This tuition scholarship of \$100 established in 1960 is awarded annually to a pharmacy student enrolled in the third, fourth, or fifth year who is in good scholastic standing and in financial need, and living in the area covered by the South Middlesex Pharmaceutical Association (Arlington, Belmont, Lexington, and Watertown). The recipient will be selected by the Scholarship Committee.

**South Shore Pharmaceutical  
Association Scholarship Pharmacy**

The Scholarship Committee of the Association will select a freshman student in June of each year living in the area covered by the South Shore Pharmaceutical Association (Quincy, Braintree, Weymouth, Hull, Randolph, Hingham, Holbrook, and Cohasset) who will be awarded a \$100 scholarship to be applied to the tuition of the first semester of the sophomore year.

**Springfield Druggists'  
Association Scholarship Pharmacy**

A scholarship of \$100 is offered by the Springfield Druggists' Association. This is to be awarded to a sophomore or junior who maintains the highest average in the Department of Pharmacy, and who is worthy and in need of financial assistance. The Springfield Druggists' Association Scholarship Fund was established in 1956.

**The Stop & Shop Companies, Inc.,  
Student Loan Fund** All Colleges

Established in 1974 by The Stop & Shop Companies, Inc., this Student Loan Fund is a combination endowment and revolving fund to be funded by \$100,000. This generous gift recognizes the contribution, in human terms, made through the years by Northeastern to Stop & Shop, which at the time the Loan Fund was established, counted more than 120 Northeastern men and women in its executive ranks, seven of them vice presidents.

The Loan Fund will assist students who have a substantial investment in their education, but are in need of some financial stimulus to aid them in completing their work.

**Student Loan Fund—  
Health Professions** Boston-Bouvé,  
Nursing and Pharmacy and  
Allied Health Professions

In 1974, a foundation established a perpetual loan fund at Northeastern University to benefit full-time students enrolled as middlers, juniors, and seniors in Boston-Bouvé College, the College of Nursing, and the College of Pharmacy and Allied Health Professions. This Loan Fund will aid those students who have a substantial investment in and commitment to the health professions and who require some financial help to complete their preparation.

**The Dr. Ruth E. Sullivan  
Memorial Scholarship Fund**  
Liberal Arts

This fund was established at Northeastern University in 1976 through the generosity of family, friends, and colleagues of Dr. Sullivan who was a member of the Department of English from 1968 until her death in 1976. One or more scholarships are awarded annually to undergraduate or graduate students who demonstrate academic achievement and excellence in interdisciplinary studies in liberal arts such as literature and psychology, the field to which Dr. Sullivan contributed so significantly.

**Ruth Page Sweet  
Scholarship Fund** Boston-Bouvé

This fund was established in 1959 by members of the Class of 1919 and alumnae of the Bouvé-Boston School in honor of their classmate, Miss Ruth Page Sweet, dean of women in the school from 1929 to 1946, administrative director from 1946 to 1948, and director from 1948 to 1958. The scholarship is presented to a junior or senior who has demonstrated a high level of professional promise by his or her academic record and extracurricular activities.

**A. Gilbert Tenney  
Scholarship Fund** Engineering

This fund is in memory of A. Gilbert Tenney, who served as a captain in the Air Force during the Korean War and was killed while in active service. The income from the fund will be awarded to a needy student or students in the field of electrical engineering, studying under the Cooperative Plan of Education.

**The Earl H. Thomson  
Memorial Scholarship**  
All Colleges

This fund was established in 1971 to honor the memory of Earl H. Thomson, a distinguished alumnus of the Class of 1925. Mr. Thomson became an internationally known trademark attorney as senior partner in the firm of Thomson and Thomson. A member of the Northeastern Corporation since 1958 and a Trustee of the University since 1960, he also was a Director of The National Council, former President of the Northeastern Alumni Association and a member of the Board of Directors of Nu Epsilon Zeta fraternity.

The scholarship is awarded annually to one or more deserving and needy students enrolled as freshmen and/or upperclassmen who demonstrate a desire to fulfill the limits of their ability in academic and cooperative periods of study. The scholarship is open ended so that additional sums can be added to it in future years and will be administered and awarded by the University without restrictions as to race, creed, geographic origin, or scholastic attainment. It would be Mr. Thomson's desire that scholarship recipients assume a moral obligation to reimburse this or other scholarship funds as they may be able, in order to make additional financial aid available for other students in later years.

**The Elliot F. Tozer Memorial  
Scholarship** Business  
Administration and Engineering

This fund was established in 1972 through the generosity of the members of the Class of 1931 in memory of their faculty adviser, Eliot F. Tozer. The scholarship is awarded annually to students of proven need in the middler, junior or senior classes of the day Colleges of Engineering or Business Administration. The scholarship is open-ended so that additional sums can be added to it in future years. It will be administered and awarded by the University without restrictions as to race, creed, geographic origin, or scholastic attainment.

**Charles Irwin Travelli  
Scholarships** All Colleges

Numerous scholarships have been given yearly since 1950 to students demonstrating financial need, high academic achievement, and an active interest in University life as shown by participation in one or more major activities. Students are named as recipients of Travelli Scholarships at the completion of their sophomore year. Under normal circumstances, these awards will continue through the senior year.

**Samuel Ulman  
Scholarship Fund** All Colleges

This fund was established in 1960 by Mrs. Samuel Ulman in memory of Samuel Ulman, a student at Northeastern University from 1912 to 1915. The purpose of the fund is to provide scholarship assistance to students in good academic standing who have financial need.

**Uniroyal Foundation Scholarships**  
Engineering, LA, BA

The Uniroyal Foundation has established scholarships to be awarded to students in the Colleges of Engineering, Business Administration, and Liberal Arts who qualify on the basis of leadership and character, academic performance and potential, need for financial assistance, and demonstration of interest in a career in industry.

Recipients assume a moral obligation to repay at least 25 percent of any scholarship received to the University Scholarship Fund after graduation. Students must have completed at least two years of their undergraduate program to be eligible.

**University Scholarships**  
All Colleges

Northeastern University has for many years maintained a scholarship fund for deserving, qualified students. These scholarship are awarded on the basis of need, scholastic standing, and campus citizenship. The recipient of a Northeastern scholarship must be willing to assume a moral obligation to repay the University at some future date.

**Sabestino Volpe  
Scholarship Fund** Engineering

The Sabestino Volpe Scholarship Fund was established in 1972 through the generosity of Mr. Sabestino Volpe, a distinguished alumnus of the College of Engineering and a member of the Class of 1928. The income from the fund is awarded annually as a scholarship to an upper-class student enrolled in the Civil Engineering degree day program within the College of Engineering. Recipients must demonstrate financial need, academic stability and soundness of character.

**Henry E. Warren Scholarships**  
All Colleges

Established in 1958 by the Warren Benevolent Fund, Inc. The purpose of these scholarships is to encourage students to gain cooperative work experience reinforcing study in their major field.

Scholarship awards in the total amount of \$1,000 are awarded annually without restrictions as to race, creed, or national origin, to upper-class students in fields in which related cooperative work positions are few or poorly paid. The recipients of the scholarship must have demonstrated good scholastic standing, fine character, and financial need.

**The Jacob Wasserman  
Scholarship Fund** Pharmacy

Established in 1966 by his friends in memory of Jacob Wasserman, this fund is to provide scholarship aid to a senior student in the College of Pharmacy and Allied Health Professions. The award will be made annually on the basis of financial need, academic performance, and personal qualities.

## Honor Societies and Academic Awards

### HONORS AND AWARDS

The University encourages the achievement of excellence in scholarship by making monetary awards and chartering honor societies in the various academic disciplines.

#### *Honor Societies*

The following honorary societies are chartered in the Colleges:

The Academy—in the College of Liberal Arts

Alpha Kappa Delta—in the College of Liberal Arts, Sociology Department

Alpha Pi Mu—in the College of Engineering, Department of Industrial Engineering

Beta Alpha Psi—in the College of Business Administration, Accounting Concentration

Beta Gamma Sigma—in the College of Business Administration (Massachusetts Delta Chapter)

Boston-Bouvé Honor Society—in the College, all Departments

Chi Epsilon—in the College of Engineering, Department of Civil Engineering

Delta Phi Alpha—national German honor society

Eta Kappa Nu—in the College of Engineering, Department of Electrical Engineering (Gamma Beta Chapter)

Kappa Delta Pi—in the College of Education

Omega Chi Epsilon—in the College of Engineering, Department of Chemical Engineering

Phi Alpha Theta—in the College of Liberal Arts, Department of History (Northeastern Zeta Tau Chapter)

Phi Kappa Phi—national interdisciplinary honor society

Phi Sigma—in the College of Liberal Arts, Department of Biology

Phi Sigma Iota—in the College of Liberal Arts, Romance Languages (Iota Zeta chapter)

Pi Sigma Alpha—in the College of Liberal Arts, Department of Political Science (Northeastern Delta Gamma Chapter)

Pi Tau Sigma—in the College of Engineering, Department of Mechanical Engineering (Northeastern Tau chapter)

Rho Chi Society—in the College of Pharmacy and Allied Health Professions (Beta Tau Chapter)

Sigma Theta—in the College of Nursing

Sigma Xi—Scientific Research Society of North America

Tau Alpha Pi—in Lincoln College (national engineering technology honor society)

Tau Beta Pi—in the College of Engineering (Massachusetts Epsilon Chapter)

Election to the college honorary societies is based primarily upon scholarship, but, before a man or woman is privileged to wear the honorary society insignia, there must be evidence of an integrity of character and an interest in the extracurricular life of the University.

The societies have memberships consisting of the outstanding men and women in the Colleges. Election to an honorary society is the highest honor that can be conferred upon an undergraduate.

#### *Awards for Upperclassmen*

University awards are determined by scholastic and citizenship achievement. They are presented by appropriate committees headed by the Dean of Students.

#### **The Academy Award** Liberal Arts

The Academy, the honor society of the College of Liberal Arts, offers annually an award of \$100 to the sophomore in the College of Liberal Arts who, during the previous year as a freshman, made the highest scholastic record.

#### **William Jefferson Alcott, Jr., Award**

This award of \$200 was established in 1934 by members of the faculty and other friends to perpetuate the memory of William Jefferson Alcott, Jr., a brilliant member of the Northeastern Department of Mathematics from 1924 until his death in 1933. The award to a senior is made annually from the income of the fund "for outstanding performance, either in the way of unusual excellence in routine work, or in connection with some intellectual activity outside or beyond the requirements of the curriculum."

#### **Alumni Awards for Professional Promise** All Colleges

Established in 1947 by the Alumni Association, these awards are presented annually at a final senior class meeting in the spring of the year. The awards are made to the outstanding seniors in each of the Basic Colleges who have demonstrated unusual professional promise through their character traits, scholastic achievement, and cooperative work performance.

#### **Beta Alpha Psi**

"The purposes of this fraternity shall be: To instill in its members desire for self-improvement; to foster high moral and ethical standards in its members; to encourage and give recognition to scholastic and professional excellence; to cultivate a sense of responsibility and service in its members; to promote the collegiate study of accountancy; and to provide opportunities for association among its members and practicing accountants."

#### **The Beta Gamma Sigma Society Award** Business Administration

"The purpose of this society shall be to encourage and reward scholarship and accomplishment among students of business administration, to promote the advancement of education in the art and science of business, and to foster integrity in the conduct of business operations."

Election to membership in Beta Gamma Sigma is the highest scholastic honor that a student in business administration can win.

The Massachusetts Delta Chapter of Beta Gamma Sigma, the national honorary society of colleges of business administration, offers an annual scholarship of \$100 to the sophomore in the College of Business Administration who, during the previous year as a freshman, made the highest scholastic record.

#### **Boston-Bouvé Honor Society Awards** Boston-Bouvé

The society offers an annual award of \$100 to the sophomore in Boston-Bouvé College who, during the previous year as a freshman in the College, made the highest scholastic record. Each student voted into the Society receives an engraved certificate at a special Honors Assembly.

#### **Cooperative Education Awards** All Colleges

These awards are presented to seniors in each of the Basic Colleges in recognition of outstanding performance in the Cooperative Education Program, through which they have personified the objectives and ideals of the University. The awards are presented at the Annual Awards Luncheon.

#### **Sears B. Condit Honor Awards** All Colleges

These awards were established in 1940 through the generosity of Sears B. Condit. At Honors Day Convocation, Sears B. Condit Honor Awards are awarded annually to outstanding students in the senior class. Each award carries a stipend as well as a certificate of achievement.

**Director's Award**

The Director's Award of \$100 is made annually by the Director of the African-American Institute to the individual judged by the Director to be the most outstanding black senior. The award is based on involvement in African-American Institute programs and scholarship, as well as interaction with the community at large. The award is presented at the Awards and Unity Banquet in June.

**Alfred J. Ferretti Award**  
Engineering

Tau Kappa Chapter of Pi Tau Sigma, the Mechanical Engineering National Honor Fraternity, sponsors an annual award to the sophomore mechanical engineering student at Northeastern having the highest scholastic standing. The award is named in honor of Professor Ferretti, who retired June 30, 1961, after 43 years of service to the University.

**Clara and Joseph F. Ford Awards** All Colleges

The Ford Awards are made to students who have shown a democratic and tolerant spirit and who are well disposed toward people of all creeds and races. They are chosen from the senior class, and judged on the basis of their contributions through participation or leadership and their extra-curricular organizations. Students must have demonstrated by their actions that they are particularly tolerant and willing to work with and for other people.

**The Gamma Phi Kappa Fraternity Award Fund** All Colleges

The Gamma Phi Kappa Fraternity Award Fund, established in 1972 by the Brotherhood and Alumni of Gamma Phi Kappa Fraternity, is awarded to an entering freshman or undergraduate student in any of the Basic College Day Programs at Northeastern University. Preference will be given to students based upon demonstrable financial need. Brothers of Gamma Phi Kappa Fraternity are not eligible for this award.

**The Harold D. Hodgkinson Achievement Awards** All Colleges

Established in 1954, the Harold D. Hodgkinson Achievement Awards of \$500 each are granted annually to a senior student in Division A and Division B. The winners of the awards are known as the Hodgkinson Scholars for the year in which they are chosen.

The award is based primarily upon distinguished scholastic achievement with due consideration of character, personality, qualities of leadership, co-operative work experience, military record (if any), and service in voluntary organizations and activities. Student leadership accomplishments and professional potential are evaluated in connection with these criteria.

The Hodgkinson Scholar is chosen by a committee of administrative members of the faculty. An appropriate certificate is presented to each recipient as a permanent record of his selection.

**Kappa Delta Pi Award**  
Education

Kappa Delta Pi, the College of Education honor society, offers an annual award of \$100 to the education sophomore who, during the freshman year, achieved the highest scholastic record.

**The Lilly Achievement Award**  
Pharmacy

The Lilly Achievement Award is given to a graduating senior for superior scholastic and professional achievement. Leadership qualities, professional attitudes, and academic performance will be considered in the selection of the individual for this award.

**Julia and Merrill Robert Lovinger Award** All Colleges

This annual \$100 award was established in 1960 by William Lovinger for the purpose of giving assistance to a student of acceptable scholastic standing who can demonstrate financial need.

**Robert Lubets Award**  
Business Administration

The award was established in 1953 by the Boston accounting firm of Robert Lubets & Company to recognize outstanding professional development and personal growth by students training for careers in accounting. Two hundred dollars will be awarded to that degree candidate who, at the completion of his junior year, has demonstrated the greatest personal growth and professional development as evidenced by his improvement in scholastic achievement accompanied by professional aptitude indicative of future success as an accountant.

**McKesson & Robbins, Inc.,  
Scholarship** Pharmacy

This scholarship of \$200, given annually by McKesson & Robbins, Inc., is awarded to a worthy student in financial need.

**Ruth E. Phalen Memorial  
Award Fund** All Colleges

This fund was established in 1959 by Thomas E. Phalen Jr., a member of the faculty, in memory of his wife. The income from this fund is used yearly as a cash award to a senior, junior, or middler, preferably in the College of Engineering, who maintains at least a 2.0 academic average, shows outstanding ability in one or more varsity sports, and demonstrates excellent campus citizenship.

**The Phi Sigma Society Award**  
Liberal Arts

Phi Sigma, honor society in the Department of Biology, offers an annual award of \$50 to the junior or senior majoring in biology or a related science who demonstrates the greatest research potential. To qualify for the award, the student must be a member of Phi Sigma.

**Roland Guyer Porter  
Memorial Fund**  
Electrical Engineering

This fund was established in 1953 by colleagues and friends of the late Professor Roland G. Porter, for many years head of the Department of Electrical Engineering. Interest from the fund provides an annual award to a student in the Department of Electrical Engineering who best exemplifies the qualities of mind and character which Professor Porter did so much to develop in his lifetime.

**President's Awards**  
All Colleges

At the annual Honors Day Convocation, six awards of \$200 each, known as the President's Awards, are presented to the students with outstanding records in both divisions of the sophomore, middler, and junior classes.

**The William Rand Award**  
Engineering

The Massachusetts Epsilon Chapter of Tau Beta Pi annually offers an award of \$50 to the outstanding middler in the College of Engineering. The award is based upon outstanding scholarship, breadth of interest, and contribution to the University. All middlemen with a 3.5 average or above are eligible; and the winner is chosen after careful screening and interviews with members of the chapter.

**ROTC Awards**  
ROTC

Awards totaling \$1,000 are available to ROTC cadets each year. The University offers ten \$50 awards annually—four to sophomores, four to middlemen, and two to juniors.

Scabbard and Blade (the cadet officers' honorary society) offers one award annually to middlemen. The Pershing Rifles (the basic course honorary society) offers a \$50 award to a sophomore Pershing Rifles cadet.

Academic Achievement Awards are won by each cadet in the top 10 percent of ROTC classes. This award, a wreath, is worn above the right breast pocket of the uniform during the year immediately following. Leadership Achievement Awards, consisting of letters of commendation, are awarded to each cadet in the top 10 percent in leadership potential.

Many medals and trophies are also awarded by other organizations to ROTC cadets for achievements in diverse fields.

**Nguzo Saba Award**

Two Nguzo Saba Awards are presented each year by the African-American Institute to the black male and female who have proved themselves of invaluable service to the black community of Northeastern University and Boston. The award is in the amount of \$100 and is presented at the Awards and Unity Banquet.

**Sigma Theta**  
Nursing

Sigma Theta, the honor society in the College of Nursing, annually offers an award of \$100 to the sophomore in the College of Nursing who, during the previous year as a freshman, made the highest scholastic record.

**Max Starr Award**  
Business Administration

The Max Starr Award in Public Accounting was established in 1968 by the Max Starr Foundation to recognize every other year an outstanding member of the junior class in the College of Business Administration preparing for a career in Public Accounting. The recipient is chosen on the basis of both academic and cooperative work records as well as personal qualities. The student receives awards of \$250 in the both the junior and senior years.

**Tau Beta Pi Award**  
Engineering

Massachusetts Epsilon Chapter of Tau Beta Pi Association, national honorary society in engineering, annually offers a scholarship of \$100 to the sophomore in the College of Engineering who, during the previous year as a freshman, made the highest scholastic record.





# Housing

## RESIDENCE HALLS

Northeastern University's location in one of the most central and exciting sections of Boston plays an important part in your education. With residence halls on the Back Bay campus, between the Museum of Fine Arts and Symphony Hall, the city is at your doorstep. Northeastern's library, student center, and athletic facilities are nearby.

Most of the residence halls have lounge areas and recreation rooms, including color television. Privacy and a quiet study environment are encouraged, but students must recognize that residence hall living cannot provide the privacy and quiet they may enjoy in their own homes.

Each hall is staffed with a Housing Administrator and students who serve as Residence Assistants. A natural advantage to resident living is increased involvement in social and educational activities. The benefits, as well as the occasional inconveniences of living in a community, contribute to personal growth. Students are encouraged to join the committees that make decisions about student life.

### Housing Contracts

Students requesting University housing on their application for admission will receive two housing contracts with their certificate of acceptance, one for their files, and one to be returned with the deposit to the Office of the Bursar, 245 Richards Hall. The required deposit for new students is \$100; for upperclass students returning to the halls, the fee is \$50. The deposit for University apartments is \$100. Room assignments are mailed approximately three weeks prior to registration.

A housing contract for freshmen is for three full quarters of the year. Upperclass transfer students must file more often since their contract is for one quarter at a time. Contracts for summer quarter freshmen are handled on an individual basis in accordance with the student's academic schedule.

### Married Students

No University housing is available for married students. However, the University does maintain a file of off-campus apartment listings. This information is available at the Dean of Students' Office for Housing Affairs, 104-106 EL.



### **The Selection**

The choice of housing is an important consideration for the first year, and freshmen are encouraged to visit Northeastern before making a decision. Although it is optional, the University recommends that students not living at home reside in University housing. Tours of residence halls are available by advance arrangement with the Department of Admissions.

Upperclass and transfer students may live in either residence halls or apartments. Men's residence halls are designed to house from two to six students in one area. Some of the larger rooms house three men while "group areas" have a total of six men in two or three rooms. Most women's rooms are for one or two students except in co-ed facilities where triple rooms are available.

The University maintains many apartment units for upperclass men and women which accommodate up to four students. Selection depends upon availability, as well as the date of receipt of housing contract and deposit which determine the order in which housing is assigned. Each unit is fully furnished and the rental charge includes utilities.

Arrangements for off-campus housing are the responsibility of the student and the student's family. Those within commuting distance should be sure of housing for the year before signing a contract.

### **Fraternity Housing**

Certain fraternities provide opportunities for room and board for men at reasonable rates. Information regarding these housing facilities may be obtained from the Dean of Students Office for Housing Affairs, 104-106EL, Northeastern University, Boston, Mass., 02115.

### **Cars**

**Freshmen living in residence halls are not allowed to have cars or other powered vehicles on campus.**

**Upperclass students are strongly discouraged from bringing cars with them, as the University does not permit overnight parking and there is a severe shortage of public spaces near the University.**

### Costs for Room and Board per Quarter

<i>Women's Residence Halls</i>	
Stetson Hall, West	\$700.00
Stetson Hall, East	\$700.00
Kerr Hall	\$650.00
<i>Co-ed Residence Halls</i>	
Smith (upperclass students only)	\$650.00
Speare	\$700.00
White	\$650.00
<i>Men's Residence Halls</i>	
Melvin Hall	\$650.00
Light Hall	\$650.00
115 Hemenway	\$600.00
119 Hemenway	\$600.00
153 Hemenway	\$600.00
157-163 Hemenway	\$710.00
40 Evans Way	\$625.00
<i>Apartments (food plan not included)</i>	
106-122 St. Stephen Street	\$380.00
Coleman-Huntington Avenue	\$380.00
Mark-St. Stephen Street	\$380.00
454 Huntington Avenue	\$380.00
464 Huntington Avenue	\$400.00
<i>Meals Only</i>	\$325.00

The above figures do not include meal tax which will be added to food costs. **All rates are subject to change.**

### Security

Security for the residence hall areas is provided by professionally trained University police officers and entrance proctoring system. Residents are required to show appropriate identification to the security proctor when entering the residence hall. Guests, both male and female, must sign in with the proctor.

The University Police provide escort service for students who wish to go from one section of the campus to another late at night.

### University Food Service

The University food plan provides for 21 meals per week, and all students who live in University residence halls are required to participate. When conditions warrant, such as during weekends and slow periods, the University may close or consolidate certain dining facilities.

## Student Activities



Northeastern University regards student activities as an integral part of education. The purpose of the program is to provide students with a variety of opportunities for experience, training, recreation, and the pursuit of spare-time interests. By participating, students not only add to their personal development and build up assets which may be as important on graduation as their academic record, they also contribute to the life of the University.

At present, on Mondays and Thursdays of each week two hours are set aside for student activities. No classes are scheduled. Instead, students attend their choice of the more than 130 separate clubs, organizations, and interest groups that meet during these periods. As a further indication of the importance the University puts on activities, the advisory system has been extended to the program. Thus, an adviser of an organization maintains continuity and liaison between divisions and establishes an essential reference position for all students. The role played by the adviser often has considerable bearing on the success or failure of an organization and on important public relations and attitudes.

Since its opening in the Fall of 1965, the Carl S. Ell Student Center has become the students' favorite meeting place on campus. Open seven days a week, the Student Center provides lounges, meeting rooms, a patio area for socializing, study areas, recreational facilities, and a cafeteria for the full use of the student body. Although many of the rooms are designed to serve multiple purposes, the following facilities are included: the little theatre and drama rehearsal room; the *Rathskeller* (the Student Pub); music practice and rehearsal rooms; exhibition areas; student organization offices; publication areas and a student radio station; meeting rooms, a typing room, and space for a variety of recreational facilities including pocket billiards, ping pong, chess and checkers. Complementing these activities is a full array of concerts, distinguished speakers, movies, plays, and dances.

## **Special Interest Groups**

### **All University Activities**

Radio Station WRBB-FM  
Social Council  
Student Center Committee  
Student Federation  
Student Union

### **Artistic Organizations**

Creative Council on Black Art  
Dance Theatre  
Silver Masque

### **Educational Organizations**

Arabic Club  
Biology Club  
Black Engineering Students Society  
Computer Club  
Geology Club  
Health Careers Club  
Hellenic Club  
International Students' Forum  
Islamic Society  
Israel Forum  
Medical Laboratory Science Club  
Medical Records Student Association  
Physics Club  
Recreation Education Club  
Student American Pharmaceutical Association  
Students International Meditation Society  
Tactical Society  
Together Phi Together  
Young Black Businessmen's Association

### **Musical Organizations**

Early Music Players  
Ethnomusicological Society  
N.U. Band  
N.U. Chorus  
N.U. Orchestra

### **Political and Social Action Organizations**

Chinese Students' Club  
Ecology Coalition  
Gay Student Organization  
Young Socialist Alliance

### **Publications**

*Cauldron*  
*Northeastern News*  
*Spectrum*  
*The Onyx*

**Recreational Organizations**

African-American Photo Society  
C.A.R. Club (College Auto Racing)  
Chess Club  
Evening Ski Club  
Evening Student Council  
Fencing Club  
Flying Club  
Gymnastics Club  
Hus-Skiers and Outing Club  
Jazz Dance Club  
Judo Club  
Karate Club  
Kung Fu Club  
Model Railroad Club  
Modern Dance Club  
Men's Volleyball Club  
Photography Club  
Radio Club  
Rifle Team  
Scabbard and Blade  
Soccer Club  
Sport Parachute Club  
Sports Car Club  
Underwater Society  
Table Tennis Club  
Yacht Club

**Religious Organizations**

Bahai Association  
Campus Crusade for Christ  
NU Christian Fellowship  
The Christian Science Organization  
Hillel



### Fraternities

The twelve recognized fraternities (seven local and five national) play an important role in the extracurricular life of the University. The frats and their addresses follow:

Alpha Epsilon Pi  
1288 Commonwealth Ave.  
(Apt. #6)  
Boston, Ma 02135  
734-1345

Alpha Kappa Sigma  
29 Greenough Ave.  
Jamaica Pl, Ma 02130  
524-9869

Beta Gamma Epsilon  
234 Commonwealth Ave.  
Boston, Ma 02116  
247-8736

Delta Chi  
12 Wadsworth St.  
Allston, Ma 02134  
787-5246

Gamma Phi Kappa  
11 Vancouver St.  
Boston, Ma 02115  
427-8774

Iota Phi Theta  
360 Huntington Ave.  
(255 EC)  
Boston, Ma 02115  
437-2632

Nu Epsilon Zeta  
255 St. Paul St.  
Brookline, Ma 02146  
566-9338

Phi Beta Alpha  
6 Cerina Rd.  
Jamaica Pl, Ma 02130  
524-9668

Phi Gamma Pi  
241 Kent St.  
Brookline, Ma 02146  
566-8970

Phi Sigma Kappa  
37 Greenough Ave.  
Jamaica Pl, Ma 02130  
524-9893

Tau Kappa Epsilon  
15 Wadsworth St.  
Allston, Ma 02134  
254-9680

Zeta Beta Tau  
42 Chestnut Square  
Jamaica Pl, Ma 02130  
522-5162

### Sororities

The four recognized sororities (one local and three national) also play an important role in the extracurricular life of the University. Although none have separate houses, they can all be reached through the Office of Student Activities, room 255 EC, telephone 437-2642, at the University. The four sororities are:

Alpha Kappa Alpha  
Alpha Sigma Tau  
Delta Phi Epsilon  
Omega Sigma

### Intramural Sports

The intramural sports programs for men and women are organized to permit students to participate as members of a sports club, as members of a team, or as individuals on a nonteam, "drop-in-and-participate" basis. Sports activities are scheduled according to seasonal interests, and include aquatics, badminton, basketball, boxing, gymnastics, handball, jogging, judo, track, volleyball, and weight and training.

### Professional Societies

Students will benefit in many ways by joining the student chapter of a professional society in an area of study of particular interest to them. They will keep up with latest developments by listening to authorities in that field, they will have an opportunity to exchange ideas with students from other colleges and universities as well as from Northeastern; and they learn more about professional standards.

If students take an active part by attending regular meetings and social affairs, they may become officers or members of a delegation to meetings outside the University. Such participation may prove invaluable in shaping a career.

The following professional societies are open to upperclassmen in their respective professional fields. The majority are national organizations:

- Accounting Society (local)
- Alpha Zeta Omega (pharmacy)
- American Chemical Society
- American Finance Association
- American Institute of Chemical Engineers
- American Institute of Industrial Engineers
- American Marketing Association
- American Pharmaceutical Association
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- Council of Professional Engineering Societies
- Institute of Electrical and Electronic Engineers
- National Education Association
- Phi Chi Theta (business administration sorority)
- Sigma Delta Chi (journalism)
- Society of American Military Engineers
- Society of Women Engineers







## PHOTO- IDENTIFICATION OPERATION

All full-time students, staff and faculty are required to have an officially approved and properly validated photo-identification card. All students are required to show their card at the Library, Athletic Events, Student Elections, Health Services, Bursar's or Registrar's Office.

An official I.D. card will be issued to new students at their initial orientation and registration periods. Replacements for lost cards can be obtained by going FIRST to the Bursar's Office, 248 RI, and then 255 EC, between the hours 11:30a.m.-2:30p.m., Monday through Friday, for the photo.

## RELIGIOUS LIFE

Interfaith Chapel services are held in the Bacon Memorial Chapel, located in the Ell Student Center. These voluntary religious services are planned to commemorate special days and events, and will be announced sufficiently ahead of time. The Chapel is also used for denominational worship services and special lectures on religion. It is open daily for prayer and meditation, and is a frequent setting for weddings of students and alumni. The denominational chaplains are available in nearby Chaplains' Rooms.

The Northeastern Interfaith Chaplain's Association, along with the Advisory Committee on University Religious Life, has genuine concern for the religious and moral development of students of all faiths. Although the religious life at Northeastern emphasizes the interfaith and ecumenical spirit, denominational student organizations are given full support on campus. These organizations are officially recognized by the Student Affairs Committee and are listed in the section entitled, "Student Interest Groups." Most of these groups have their chaplains, their officially appointed faculty advisers, and student officers.

## THE DEPARTMENT OF ATHLETICS

All students are urged to participate in the University's athletic program, which includes all major collegiate sports. The University maintains varsity and subvarsity teams in baseball, crew, cross-country, track, football, hockey, skiing, basketball, and golf. These teams are among the finest in the East and have represented the University in both national and international competition. Students may also participate in such sports as riflery, sailing, swimming and water polo.

Facilities include the spacious Cabot Physical Education Center and Edward S. Parsons Field. The gymnasium contains four basketball courts and one gymnastics court, a rifle range and a cage which provides facilities for indoor track as well as baseball and football drills. Parsons Field houses the Huskies' football stadium with its new artificial turf and the Northeastern baseball diamond. It also accommodates training areas for the outdoor track team. The Northeastern crew enjoys a spacious white boat house on the Charles River and also works out in the Cabot complex, where rowing tanks are located.

Success has been a tradition at Northeastern. Of the major teams competing over the last 10 years, 68 have had victorious seasons while only 16 have ended in the red column.

Northeastern annually fields one of the toughest football teams in New England. In the last 10 years, they have enjoyed six winning seasons while competing against such Eastern powers as Temple, Harvard, and Holy Cross. The finest team in the recent past was 1963's undefeated squad which went on to play in the Eastern Bowl.

The University's hockey team is traditionally one of the most powerful in the East. It won the Eastern Collegiate Athletic Conference Holiday Hockey Tournament in 1964 and it has competed in several E.C.A.C. championships. It is annually ranked in the top 10 in the East.

Basketball teams at Northeastern also have a winning tradition. The Huskies won the N.C.A.A. Regional Championship in 1962 and 1963 and went on to compete in the national small-college championships in Evansville, Indiana. Also, in 1963, Northeastern received the E.C.A.C. College Division Trophy for the finest small-college team in the East. After competing in six N.C.A.A. College Division Championships in seven years, the Huskies moved into the University Division and now play national powerhouses like Pennsylvania and Syracuse. After ten years they have yet to have a losing season.

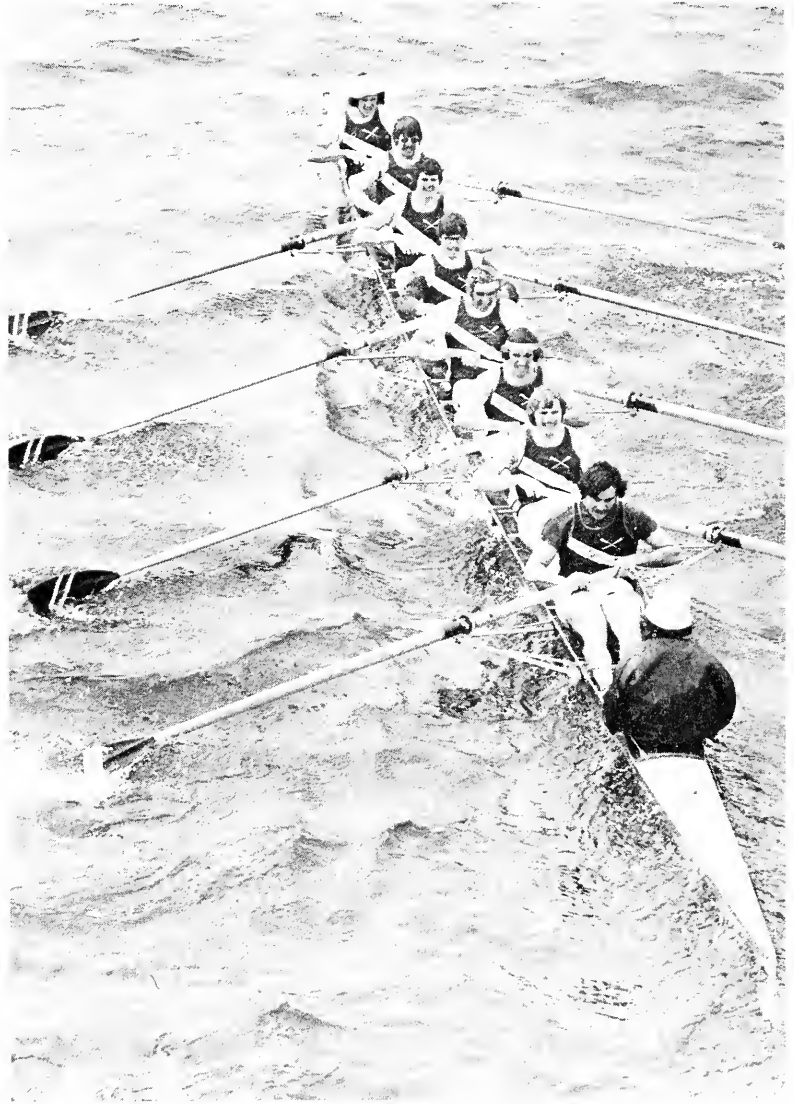
The cross-country, indoor, and outdoor track teams have been outstanding over the past decade. All three squads have never suffered a losing season. The cross-country team has been 76-21 over the past 10 years, the indoor team 81-10, and the outdoor team 57-8. Last year they won the New England Indoor Track title and the Greater Boston Cross-Country Championships.

Northeastern baseball also ranks with the best in the East. The Huskies were the New England Champions in 1966 and went on to compete in the College World Series. They also participated in the New England playoffs in 1964, 1972, and 1973. Coach John Connelly has posted winning seasons in seven of the last 10 seasons and was New England Coach of the Year in 1964.

Northeastern instituted skiing as a varsity sport in 1970. The team competes in the prestigious Osborne Division of the New England Intercollegiate Skiing Conference and, under coach Ed Elliott, has yet to post a losing season.

The most amazing Husky sport story is that of the Northeastern crew. In 1965, their first season, they won four out of five regattas, the small college rowing championships, and became the first N.U. team to participate in international competition when they rowed in the Henley Royal Regatta. The next year, the Huskies moved into the major college rowing league. They culminated their swift rise when coach Ernie Arlett's eight won the Eastern Sprints in 1972 and 1973 and rowed in the finals of the Grande Challenge Cup of the Henley Royal Regatta. In 1973, they were considered the finest eight in the nation.

For a description of women's sports, as well as information concerning intramural programs, please turn to the section on Boston-Bouvé College, pages 35 to 47.



## FOREIGN STUDENT INFORMATION



The University welcomes qualified students from foreign lands who are adequately prepared to benefit from the educational, cultural, and social opportunities it has to offer. Eighty countries are currently represented within our student body.

Northeastern University is authorized under federal law to enroll nonimmigrant aliens as full-time students in degree-granting programs of its basic undergraduate colleges and graduate schools. Part-time and special students are not included in this authorization.

Because of problems of adjustment experienced by many students from foreign countries, the University makes a special effort to carefully evaluate the educational and financial qualifications of prospective students. The University has a Foreign Student Adviser and staff to administer the special needs of these students.

Students who are seeking to study English as a second language in an intensive program may enroll for the noncredit course at the English Language Center. Foreign students who need to have their English skills evaluated, and those who wish to improve their English for specific purposes, may obtain special assistance through this office. There are also English language courses for foreign students offered for credit at the freshman level.

University admissions policies for foreign students are outlined in "A Guide for Students from Other Countries," available from the Department of Admissions or the office of the Foreign Student Adviser.

The University does not award financial aid to foreign students.

## FRESHMAN ORIENTATION PROGRAMS

Except for the visits which we hope students will make to the Admissions Office, the first opportunity to learn about Northeastern and to meet classmates, deans, and advisers will come during the freshman orientation period.

The program for orientation is planned and supervised by the Dean of Students and his staff who will see to it that students are introduced to the customs and people that make up Northeastern. At that time, registration, class schedules, and other procedures and details necessary for enrollment will be completed.

During the orientation period, in accordance with a long-standing tradition, students will be welcomed by the President at special convocations. Later, they will be able to meet with deans and others who will have important roles in their college careers.

Upperclass students generously volunteer their time to assist in setting up and running programs, primarily evening events, which provide opportunities for relaxation, recreation, and cultural enrichment. The Office of the Dean of Students is available during the orientation period and throughout the year to answer questions and provide assistance. The Freshman Affairs unit of that office has special responsibility for monitoring the academic progress of all freshmen and for assisting them in a variety of ways to attain sophomore status.

# PART IV



# GENERAL INFORMATION

## GENERAL INFORMATION

### History

Founded in 1898, Northeastern University is incorporated as a privately endowed nonsectarian institution of higher learning under the General Laws of Massachusetts. By special enactment, the State Legislature has given the University general degree-granting powers. The University is governed by a Board of Trustees who are elected by and from the Northeastern University Corporation, which is composed of 174 distinguished business and professional men and women.

From its beginning, Northeastern University's dominant purpose has been the discovery of community educational needs and distinctive and serviceable ways of meeting them. The University has not duplicated the programs of other institutions, but has sought to pioneer new areas of educational service.

A distinctive feature of Northeastern University is its Cooperative Plan, initiated by the College of Engineering in 1909 and subsequently adopted by the Colleges of Business Administration (1922), Liberal Arts (1935), Education (1953), Pharmacy (1962), Nursing (1964), Boston-Bouv  College (1964), the College of Criminal Justice (1967), and by Lincoln College's daytime Bachelor of Engineering Technology Program (1971). This educational method enables students to gain valuable practical experience as an integral part of their college programs and also provides the means by which they may contribute substantially to the financing of their education. The Plan has been extended to the graduate level in engineering, actuarial science, rehabilitation administration, professional accounting, business administration, and law.

In the field of adult education, the University offers graduate and undergraduate degree programs and non-credit programs which are specifically designed to meet the needs and interests of adults who wish to further their education on a part-time basis.

All formal courses of study leading to degrees in the Graduate Division, Lincoln College, and University College are approved by the undergraduate faculties concerned, and are governed by the same qualitative and quantitative standards as the regular day curricula. Courses are scheduled in the day and evening at the Boston Campus, Suburban Campus in Burlington, and at other off-campus locations near Boston.



## General Information

### Policy on Changes of Program

The University reserves the right to withdraw, modify, augment or change the order or content of courses in any curriculum.

It further reserves the right to change the requirements for graduation, tuition, and fees charged, and other regulations. However, no change in tuition and fees at any time shall become effective until the school year following that in which it is announced.

Any changes which may be made from time to time pursuant to the above policy shall be applicable to all students in the school, college, or department concerned, including former students who may re-enroll.

### Textbooks and Supplies

The Northeastern University Bookstore, located on the ground floor of the Ell Student Center, is a department of the University and is operated for the convenience of the student body. All books and supplies which are required by the students for their work in the University may be purchased at the Bookstore.

### The Academic Year

Northeastern University operates on a quarter system calendar.

### Quarter Hour Credits

All courses are evaluated in terms of quarter-hour credit. A quarter-hour credit is equal to three-fourths of a semester-hour credit.

### Grades and Examinations

Examinations covering the work of the quarter are usually held at the close of each quarter. Exceptions may be made in certain courses where, in the opinion of the instructor, and with the approval of the Dean of the College concerned, final examinations are not necessary.

### Pass-Fail System

Students may register for a limited number of courses on a pass-fail basis. Each college has its own rules governing this system. Common to all colleges, however, is the grading system. Pass-fail grades are not included in the calculation of the quality point average. Only pass grades earn credits toward degree requirements.

### Grades

A student's grade is officially recorded by letter. A listing of grades with their numerical equivalents follows:





- A Outstanding Attainment
- B Good Attainment
- C Satisfactory Attainment
- D Poor Attainment
- F Failure
- I Incomplete
- S Satisfactory achievement in a pass-fail course. Counts toward total degree requirements.
- U Unsatisfactory achievement in a pass-fail course.
- X Incomplete in a pass-fail course.

Numerical Equivalents
4.0
3.0
2.0
1.0
0.0

A general average of D is not acceptable and will not allow a student to continue at Northeastern University.

Freshman students who are taking a full academic program and who have a weighted average for the year below 1.4 will not be permitted to register for advanced work. Upper-class students should consult the Student Handbook to ascertain the level of continuing achievement required of them by the faculty of their college.

An I, or X (Incomplete), grade is used to show that the student has not completed the course requirements.

An official University grade report is mailed to each student at the end of each quarter.

### **Transcripts**

Applications for transcripts of record are made at the Registrar's Office (120 HA). A charge of \$1.00 is made for each transcript request.

### **Dean's List**

A Dean's List, issued at the end of each quarter, contains the names of upper-class and freshman students who have a 3.0 weighted average in all subjects with no grade below C during the preceding period. No student who is on any form of probation or who is carrying a schedule below eleven quarter hours is eligible for The Dean's List.

### **Reports on Scholastic Standing**

Reports for all students are issued at the end of each grading period. Questions about grades are to be discussed with the student's faculty adviser.

At the end of the academic year, juniors will receive, in addition to their term report, a complete cumulative copy of their permanent record. This is so that the junior may be aware of any discrepancies in his record, and if so, may contact the dean of his college.

Students are constantly encouraged to maintain an acceptable quality of college work. Parents and students are always welcomed by the college officers and faculty advisers for conference upon such matters.

### **Family Educational Rights and Privacy Act**

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records wherever appropriate and to challenge specific parts of them when they feel it necessary to do so. Specific details of the law as it applies to Northeastern are printed in the *Student Handbook* and the *Northeastern NEWS*, and are distributed annually at registrations of University College and the graduate schools.

It is the policy of Northeastern University to deal with the student in all academic and administrative matters. If parents require any information regarding the progress of their son or daughter, they may contact the Dean of Students Office.

### **General Conduct**

It is assumed that students come to the University for a serious purpose and that they will conform to such regulations as may from time to time be made. The University community expects each student to respect the rights and privileges of others and to adhere to acceptable standards of personal conduct. Students should exercise their freedom with maturity and responsibility. They are expected to obey University regulations and follow the instructions of and pay due respect to University officials. Conduct inconsistent with the general order of the University may result in disciplinary action. Damage to any building or to any of the furniture, apparatus, or other property of the University will be charged to the student or students known to be immediately involved.

The University seeks to administer discipline with a high standard of integrity and a scrupulous regard for truth. The attempt of any student to present any work which is not his or her own, or to pass any examination by improper means, is regarded as a most serious offense and renders the offender liable to disciplinary action. The aiding and abetting of a student in any dishonesty is also held to be a grave breach of discipline.

### **Attendance**

Students are expected to attend all meetings of their classes. Absence from regularly scheduled classes may seriously affect the standing of the student and result in dropping the subject or subjects from his or her schedule. Laboratory work can be made up only during hours of regularly scheduled instruction.

### **Emergency Closing of the University**

Students, faculty, and staff are notified by radio when it becomes necessary to cancel classes because of extremely inclement weather. Radio stations WBZ, WEEI, WHDH, WJDA, WCOP, WRKO, WLYN, WKOX, WHAV, and WLLH-AM, and WVBF and WBCN-FM, will announce the University's decision to close.

In addition, the University maintains an emergency snow phone (262-SNOW). Whenever in doubt, call 262-SNOW and a taped message will indicate the status of classes.

## ROTC

### Reserve Officers' Training Corps

## ARMY

### FACULTY

John W. Peters, LTC, USA;  
M.S., *Professor and Chairman*

#### Assistant Professors

James D. Ryan, MAJ, USA; M.Ed  
Leo X. Dwyer, Jr., CPT, USA; M.B.A.  
Bruce R. Gale, CPT, USA; M.A.  
James W. Rooney, CPT, USA; M.Ed.

#### Instructional Staff

Stanley J. Tomsick, MSG, USA  
Smeltzer, George B., Jr., SFC, USA

### General Objectives

The Department of Military Science is the instructional department of the University which administers the Army Reserve Officers' Training Corps (ROTC) Program. The Reserve Officers' Training Corps is regarded by Northeastern University as an integral part of its educational program, and is made available on a voluntary basis to all students who are otherwise qualified.

The Reserve Officers' Training Corps of the United States Army exists for the purpose of developing officers—leaders. It offers courses of instruction leading to a commission as a second lieutenant in the United States Army Reserve or the Regular Army. The mission of ROTC is to have ready in time of national emergency a corps of educated, trained military leaders for our nation. Our Northeastern ROTC is an Army, Senior Division, Class CC (Civilian College) unit.

The staff and faculty of the Department of Military Science consist of officers and noncommissioned officers assigned by the Department of the Army and civilians assigned by the University. Officers are individually nominated for assignment to the University and are appointed only after records have been reviewed and each individual has been accepted by the University.

### Courses of Study

The program of instruction consists of a Basic Course and the Advanced Course. The Basic Course, taken during the freshman and sophomore years, and the Advanced Course, presented during the middler, junior, and senior years, provide instruction common to all branches of the Army. ROTC complements the Co-op Program by tailoring its courses to the student's availability. Graduates of the Advanced Course receive commissions as second lieutenants in the U.S. Army Reserve or Regular Army.

### **Enrollment in the ROTC Basic Course**

Enrollment in the ROTC Basic Course is voluntary and is open to all students of the Basic Colleges who meet minimal acceptance requirements. Students may withdraw from the Basic Course at any time during their freshman or sophomore year. No obligation is incurred by participating in the Basic Course.

### **Eligibility for the Advanced Course**

The Advanced Course is open to all students who are qualified. Students may qualify by any one of the following methods:

1. Successfully complete the Basic Course or its equivalency as approved by the Professor of Military Science.
2. Be an honorably discharged veteran whose service may be substituted for the Basic Course.
3. Successfully complete a summer camp of six weeks following their sophomore year if:
  - a. They are citizens of the United States and will not have reached 28 years of age at the time of commissioning;
  - b. They successfully complete such survey and general screening tests as may be prescribed;
  - c. They have three academic years to complete for graduation (two for full-time students);
  - d. They are selected by the Professor of Military Science and the University.
  - e. They successfully complete a U.S. Army physical examination.

All students accepted for the Advanced Course must execute a written contract with the Government. The current service obligation for newly commissioned second lieutenants is four months to three years depending on the needs of the Army and the desires of the officer.

### **Pay**

All Advanced Course cadets are paid \$100 monthly during actual Advanced Course instruction, up to a total of \$2,000 during the three years. Camp pay is approximately \$400 over and above housing, messing, and medical care, which are free at camp. Transportation to and from camp is also paid.

### **ROTC Scholarships**

The Army ROTC Scholarship Program is designed to offer financial assistance to outstanding young people who are interested in the Army as a career. Each scholarship provides for full tuition, fees, and textbooks in addition to pay of \$100 per month.

ROTC scholarships at Northeastern are for five-, four-, three-, or two-year periods. The five-year period scholarships are offered to entering freshmen. Enrolled ROTC cadets are eligible for the other scholarships.

These awards are not related to financial need, and the earnings of a student during his cooperative work period do not reduce scholarship payments. This award may be supplemented, when necessary, by other scholarships, loans, or part-time jobs.

Applications for entering freshmen must be submitted prior to January 15 for the following school year. Information on the ROTC Scholarship Program may be obtained by writing to the Professor of Military Science, Northeastern University.



### **Veterans**

Honorably discharged veterans (enlisted) may be enrolled in ROTC with one or both years of the Basic Course waived, depending on prior service. They must be co-aligned in ROTC with other members of their class in the University curricula. Veterans are a distinct benefit to the Corps of Cadets because their actual experiences lend color to the program and help to orient cadets without prior service. Certain credits are available to veterans depending upon service. Former commissioned officer veterans are not eligible for ROTC.

### **Transfer Students**

A student transferring to Northeastern University from another institution where he has been enrolled in an ROTC program similar to that at Northeastern is allowed credit for his work. The student's records are obtained from his former professor of military science. Such a transfer student must be co-aligned in ROTC with other students in his class.

Students transferring to Northeastern University as middlers, without previous ROTC training, may enroll in the Advanced Course providing they attend a six-week summer camp prior to the start of the middler year.

Students transferring to Northeastern University as sophomores may also enroll in ROTC as middlers providing they satisfactorily complete a six-week summer camp prior to the start of the middler year. Application should be made to the Department of Military Science no later than March 1.

Transfer students may obtain complete information and assistance from the Department of Military Science.

### **Uniforms and Equipment**

An Army uniform is issued without cost to ROTC students. A \$25 deposit is required temporarily from all students enrolling in ROTC until uniforms and property are returned in good condition. Any loss or damage to ROTC uniforms and equipment, exceeding the deposit, will be charged to the student.

### **Academic Credits**

Regulations of the individual Basic Colleges prescribe the number of hours of academic credit granted for ROTC classes.

## **AIR FORCE ROTC**

William R. Trott, Ph.D. Colonel, USAF  
*Director of the Office of Aerospace Studies, MIT*

Billy F. Webster, M.S. Major, USAF  
*Northeastern University Coordinating Officer*

Air Force ROTC is available to Northeastern University students through the Office of Aerospace Studies at MIT. While students will attend Aerospace Studies classes on the MIT campus, they are not required to enroll at MIT.

The Air Force ROTC program is designed to prepare students for commissions in the United States Air Force upon successful completion of a bachelor's degree. The Office of Aerospace Studies offers two programs — one of four years and one of two years — for Northeastern students to qualify for commissions.

The four-year program can be entered at the beginning of the freshman or sophomore year; the two-year program can be entered prior to the middler or junior years.

### **The Four-Year Program**

The four-year program consists of classroom and leadership laboratory work during four undergraduate years and one summer training period of four weeks at a United States Air Force Base between the second and third year of Air Force ROTC.

While in Air Force ROTC, students are furnished uniforms and equipment required for the program. Undergraduate students enrolled in the four-year program are offered an opportunity to compete, on a nationwide basis, in the college scholarship program. These scholarships provide full coverage for tuition, books, and required university fees plus a \$100 monthly subsistence allowance.

Unless the student accepts a scholarship, he or she is under no obligation to the government for the first two years of the four-year program. At the beginning of the third year, all students who have not already done so are required to sign a formal agreement that they will complete the last two years of Air Force ROTC and accept a commission as a Second Lieutenant in the United States Air Force when granted a degree from Northeastern. The term of active duty commitment after commissioning varies depending upon the professional area chosen.

For those entering research and development, engineering, or any other nonflying field, the term of service is four years. For pilots and navigators, the required term of service is five years after completion of flight training. Individuals may also apply to the Air Force for a delay in active duty, to pursue graduate study.

### **The Two-Year Program**

The two-year program is for those students who do not complete the first two years of the four-year Air Force ROTC program. Such students may apply as undergraduates or graduates if they have a minimum of two years remaining as full time students. In lieu of completing the first two years of the four-year program, these students receive six weeks of field training at an Air Force base during the summer preceding their entry into Air Force ROTC.

Students applying for this program may have to move co-op periods to enable them to attend this field training.

They receive the same benefits and complete the same academic program required of the upperclass four-year students. Students applying for the two-year program may also compete for scholarships.

### **Eligibility Requirements**

To be eligible to compete for a commission through the Air Force ROTC program, students must be: 1) citizens of the United States by the time they sign a formal agreement with the government; 2) physically qualified in accordance with existing Air Force regulations; 3) enrolled at Northeastern as full-time students.

### Application Procedure

Eligible freshmen can sign up for the Air Force ROTC program by simply electing Air Force ROTC subjects (91.201 and 91.202) when they arrive on campus; however, it is advisable for interested students to contact the Air Force ROTC Office as soon as they have been notified of admission to the University. Other interested students can make application by personal visit to the Office of Aerospace Studies, MIT, Building 20 Wing E, Room 111, Cambridge, Ma., or by calling (617) 253-4472.

## Cooperative Education

Roy L. Wooldridge, Ed.M., *Vice President for Cooperative Education*

Sidney F. Austin, M.Ed., *Associate Dean*

Thomas E. McMahon, M.Ed., *Associate Dean*



Cooperative Education is a dynamic system of education based on the principle that individuals can best be developed through an educational pattern that exposes them to the world beyond the boundaries of the campus. Through controlled and structured experiences, students bring an enrichment to the classroom which enhances their total development. The essential ingredients are that satisfactory participation in cooperative education is considered a degree requirement and that the institution assumes the responsibility for integrating it into the education process. It is called "cooperative education" because it is dependent upon the cooperation of outside agencies and educators in combining to form a superior total educational program.

Studies have shown that the reinforcement of classroom learning by job responsibilities increases a student's motivation and self-confidence. Greater interest in academic work develops when he sees the relationship between the job he holds and the principles he is studying on campus. These same cooperative experiences help to instill a sense of identity and worth as the student functions as an adult in an adult world.

Northeastern's commitment to cooperative education is illustrated by the diverse but related activities of the five departments within the Division of Cooperative Education. Each department makes a unique contribution to the development of cooperative education and the enhancement of its effect on Northeastern's students.

## The Department of Cooperative Education

Paul M. Pratt, M.Ed., *Dean*

Richard E. Sprague, M.B.A., M.Ed., C.A.G.S.

*Assistant Dean*

Charles F. Seaverns, Jr., Ed.M., C.A.G.S., *Director of  
Professional Development*

George A. Rowland, B.S., *Staff Specialist for Minority  
Affairs*

### FACULTY Professors

Nancy J. Caruso, M.Ed.

Charles F. Field, M.Ed.

Willie Smith, Jr., M.Ed.

Roderic W. Sommers, M.Ed.

Robert E. Vozzella, M.A.

### Associate Professors

Ernest V. Barrasso, M.Ed.

Boreslaw P. Berestecky, M.Ed.

Richard L. Canale, M.Ed., C.A.G.S.

Elizabeth A. Chilvers, M.Ed.

Robert D. Deforge, M.Ed.

John Dromgoole, M.Ed.

Philip W. Dunphy, M.Ed.

Mary R. Flynn, M.Ed.

John D. Hammond, M.P.A.

Kenneth R. Hancock, Jr., B.S.

George K. Howe, M.Ed.

Stephen M. Kane, M.Ed., M.S.,  
C.A.G.S.

Homer C. Littlefield, B.S.

Robert W. Miller, M.Ed.

Anthony R. Rotondi, M.Ed.

Jane S. Schachter, M.Ed.

### Assistant Professors

Betsey W. Blackmer, B.S.

Mark I. Conley, Jr., M.S., C.A.G.S.

Rosemarie DiMarco, M.S.

Gerard J. Lavoie, B.S.

Barbara A. Porter, M.Ed.

Mary E. Sandman, B.S.

Hugh J. Talbot, B.S.

### Instructors

Ellen J. Duwart, B.S.

Judith A. Moll, M.S.

William A. Sloane, M.B.A.

Robert R. Tillman, B.S.

This is the largest of the four departments and is responsible for the administration of the cooperative education program for undergraduate and graduate students at Northeastern. Details on the specifics of operation are explained on page 30 of this catalog and in a booklet entitled "Co-opportunities," which is available from the Department of Admissions on request.





## **The Department of Graduate Placement Services**

Alvah K. Borman, M.Ed., *Dean*

William F. Brady, Jr., M.B.A., *Director of Senior and Alumni  
Placement*

Francis L. Heuston, M.Ed., *Director of Educational Placement*

Thomas J. McEneaney, M.Ed., *Graduate and Professional School  
Counselor*

Jane M. Goring, B.S., *Alumni Placement Officer*

Evelyn Ashey, B.S., *Educational Placement Representative*

Katherine M. Owens, B.A., *Senior Placement Representative*

The Department of Graduate Placement Services offers a wide range of counseling and placement assistance to all seniors and alumni of Northeastern University and to undergraduates seeking admission to medical, law, and other professional schools.

Through this department, representatives of hundreds of employers are scheduled to visit the campus each year to interview seniors and graduate students for full-time employment after graduation. A job bank of currently available positions is maintained for alumni who are seeking new opportunities for which they may be qualified. Credential service is provided for students and alumni seeking positions in the field of education. Regularly scheduled seminars are conducted for seniors and alumni on career development, job finding techniques, resume preparation, and effective interviewing.



## **The Center for Cooperative Education and The Institute for Off-Campus Experience and Cooperative Education**



Paul E. Dubé, M.A., M.Ed., *Director, Center for Cooperative Education*

Charles E. Shain, Ph.D., LL.D., L.H.D., Litt.D., *Director, Institute for Off-Campus Experience and Cooperative Education*

Raymond R. Williams, B.A., *Assistant Director for Field Experience*

John K. Jessup, Jr., Ed.D., *Field Experience Specialist*

Ingrid Dinter, M.A.T., *Field Experience Specialist*

Patricia Molloy, M.A., *Field Experience Specialist*

Mary MacMillen, B.A., *Project Coordinator*

Joseph E. Barbeau, Ed.D., *Training Director*

Myrna N. Cornett, B.S., *Assistant Training Director*

Educational institutions and other organizations exploring, developing, expanding, or improving programs in cooperative education contact the Center for a variety of services. All facets of the establishment, operation, and expansion of programs may be explored with professional consultants familiar with all aspects of cooperative education.

Intensive, short-term training workshops for both new and experienced coordinators of cooperative programs and the four-week Summer Institute in Cooperative Education offering eight quarter-hours of credit are among the services offered by the Center.

The Institute provides counseling and placement assistance to colleges and universities which offer cooperative education programs or other types of off-campus educational experiences to their students.

Faculty coordinators from the Department of Cooperative Education work closely with the staff of the Institute in providing this assistance. Administrative costs of operating the Institute are shared by the participating institutions.

### **INTERNATIONAL PROGRAMS**

Donald R. Allen, Ph.D., *Director of International Programs*

Candace A. Herene, B.A., *Assistant to the Director of International Programs*

Northeastern University carries its unique program in cooperative education to the international scene by offering certain undergraduate and graduate students the opportunity to be placed abroad for their cooperative work. The University maintains an active foreign placement program in Germany, France, Britain, and Columbia for students whose linguistic, academic, and professional experience makes them attractive candidates for a position abroad.

In addition to direct placement abroad, exchanges for study or cooperative education work experience function with the following institutions:

Brunel University, Uxbridge, England. Study and work exchange for liberal arts students.

Ecole Supérieure de Commerce, Paris, France. Work exchange for students in business administration, liberal arts.

Ecole Supérieure de Physique et de Chimie Industrielles, Paris, France. Work exchange for students in physics, chemistry, mathematics, engineering.

Escuela de Administracion y Finanzas — Instituto Tecnológico, Medellin, Colombia. Work exchange for students in business administration, liberal arts.

Institut de Préparation à l'Administration et à la Gestion des Entreprises, Paris, France. Work exchange for students in business administration, liberal arts.

The Polytechnic of Wales, Glamorgan, Wales. Work exchange for students in engineering, business administration, education.

### **The Center for Secondary School Work Experience Education**

Ellen N. Winer, Ed.D., *Director*

Ruth M. Hochman, B.S., *Assistant to the Director*

A full complement of consulting, training, and research services is available to schools and other educational facilities, community groups, and employers interested in implementing or expanding work experience programs at the secondary school level. These services are designed to assist school faculty who have primary responsibility for initiating and conducting work experience programs to plan, implement, and evaluate their efforts.

### **The Cooperative Education Research Center**

James W. Wilson, Ph.D., *Asa Smallidge Knowles Professor of Cooperative Education and Director*

#### **Research Associates**

G. Ruth Kukiela Bork, M.Ed.

Sylvia J. Brown, M. Ed.

#### **Research Assistants**

Etsuko Kumai, A.B.

Cynthia Whitten, B.A.

Several aspects of cooperative education are being investigated, published, and disseminated among the cooperative education community. The purpose of these studies is to aid practitioners in the field so that they can be of greater service to students enrolled in cooperative education programs. As a part of its research activity, the Research Center has established an Information Clearinghouse to store information about cooperative education and make it available to interested people throughout the country. A library of cooperative education and related material is maintained for research and consulting purposes.



## University Libraries

### PRINCIPAL UNIVERSITY LIBRARY OFFICERS

<b>Director</b> , University Libraries Roland H. Moody, A.B., B.L.S.	Arline Willar, M.S. Asst. Librarian for Public Service
Albert M. Donley, M.S. Associate Director, Archivist of the University and Curator of Rare Books Library	Anastasia Cakste, M.L.S. Physics/Electrical Engineering Divisional Librarian
Thomas H. Cahalan, M.S. Asst. Librarian for Acquisitions	Richard S. Ross, M.S.L.S. Mathematics/Psychology Divisional Librarian
Ralph J. Coffman, Jr., Ph.D. Librarian, Burlington Campus	Mark Alpert, M.S.L.S. Circulation Librarian
Joyce E. Lunde, A.A. Asst. Librarian for Reference Bibliographies and Documents	Sharon C. Bonk, M.A., M.A.L.S. Periodicals Librarian
Robert G. Murray, M.Ed., M.L.S. Asst. Librarian for Cataloging	Nieves Farin, M.S.L.S. Selection Librarian
Maurice Rahilly, M.L.S. Asst. Librarian for Divisional Libraries	Roxanne B. Palmatier, M.S.L.S. Documents Librarian
	Vivian A. Rosenberg, M.Ed., M.L.S. Audio Facility Librarian

*"All that mankind has done, thought, gained, or been: it is lying as in magic preservation in the pages of books."*—Thomas Carlyle

The University Libraries endeavor to provide the informational and bibliographic services required by students and scholars working in subject fields covered by University programs of instruction and research. In all, the collections include more than 412,000 cataloged volumes. In addition, the Library holds in excess of 365,000 titles on microform including the comprehensive *Libraries of American Civilization and English Literature*.

The microform collection includes microprint, microfilm, and microfiche with appropriate equipment for reading.

Periodicals (approximately 3,775 titles received currently), government documents relevant to the University, technical reports, pamphlets, and recordings (more than 5,000) enhance the collections. There are duplicating facilities available in all libraries.

### Libraries

The Dodge Library houses the main collections, the main bibliographic resources for the library system, the central processing units,



and library administration. Its six air-conditioned reading rooms, many recently renovated, include the Richardson Room, which provides audio equipment; the Reference Room, with a collection in excess of 20,000 volumes including almanacs, atlases, bibliographies, biographical dictionaries, business services, dictionaries, directories, encyclopedias, gazetteers, handbooks and manuals, indexes and abstracts, and technical reports; the Periodical Room; the Documents Room; the Microform Room; and the Reserve Book Room with a 20,000-volume collection.

Additional libraries include the divisional libraries of Physics/Electrical Engineering, Mathematics/Psychology, and the Hurtig Hall Library (Chemistry, Biology, and Pharmacy)—all graduate level collections; the Boston-Bouvé College Library; and the School of Law Library. The Suburban Campus at Burlington has its own library, and there are also collections at the Marine Science Institute in Nahant, the Center for Management Development in Andover, and at Wiggins Airways in Norwood.

### **Services and Hours**

A handbook, A-V aids, bibliographic guides, and lectures introduce students to methods of utilizing the resources of the collections, and a dedicated staff is prepared to help users of the various libraries. All members of the University, and others at the discretion of the Librarian, have the use of reference books, government documents, card catalogs, and service. During term time, most libraries are open 7:45 a.m. to 10:00 p.m., Monday through Thursday, 7:45 a.m. to 7:30 p.m. on Friday, 1:00 p.m. to 5:00 p.m., Saturday and Sunday with certain areas in the Dodge Library open later hours in the evening.

### **New England Library Information Network**

The Northeastern Libraries have computerized many operations internally and, in addition, hold membership in the New England Library Information Network. NELINET has been established for the purpose of developing and operating major library support services. It is a network of libraries devoted to sharing financial, human, and material resources to reduce cost and redundancy, and to expand the timeliness and variety of services available.

## Office of Learning Resources

Mina B. Ghattas, Ph.D., *Director*

*The Office of Learning Resources (OLR) provides faculty, students and staff with a variety of instructional services, equipment, and learning facilities.*

*The Learning Resources Center furnishes students with individualized study and language lab facilities for remedial, supplementary, or enrichment purposes in many subject areas in many formats—programmed texts, audiotapes, videotapes, and sound filmstrips, among others. A listening lounge, equipped with a stereophonic sound system, supplies a large selection of classical and popular prerecorded music. Students may use all LRC facilities independently or to complete class assignments at no cost during day, evening, and weekend hours.*

*The Media Production and Training Laboratory provides facilities for both students and faculty for producing original materials, such as overhead transparencies, audiotapes, illustrations, slides, posters, and charts. Training is given in the use of all equipment, including that used for television production in a mini-studio. Training workshops may be arranged for organized groups.*

*Campus Media Services makes available all types of audiovisual and video equipment and instructional materials for the support of classroom instruction on a prescheduled basis. Items include film, filmstrip, slide, opaque and overhead projectors, audio and videotape recorders, TV cameras and monitors, portable public address systems, telelecture equipment, record players, and projection screens. This section also distributes instructional materials from the NU-owned collection, such as 16mm films, videotapes, filmstrips, film loops, slides, and audio cassettes. Certain equipment is reserved for student use, and students may also borrow instructional materials with faculty approval. A catalog of all instructional materials is available at no charge.*

*The Instructional Materials Center, which acquires and maintains the collection of NU-owned instructional materials, also provides a rental service for 16mm films and videotapes obtained from outside sources. Faculty who would like to evaluate instructional materials before purchase make use of its preview service. Preview facilities are available for small-group viewing of all types of materials by members of the University community. An up-to-date collection of research reports, periodicals, instructional materials, catalogs, and other reference volumes on all aspects of instructional media and technology is similarly accessible.*

*The Instructional Development Center assists individual faculty with specifying instructional goals, reviewing related literature and materials, examining alternative teaching strategies, producing learning materials, and evaluating course effectiveness. Its training in presentation and teaching techniques is complementary to its basic function of developing instructional units and courses.*



## University Health Services

### Lane Health Center

Job E. Fuchs, M.D., *Director*

A comprehensive program of medical care is provided to all full-time registered students in the Basic Colleges, both graduate and undergraduate. The University maintains a Health Services Clinic in the Forsyth Building, Room 135, which is open for emergencies at all times, and is equipped to deal promptly with any medical condition that may arise. All entering students must file a record of physical examination with Health Services. Failure to fulfill this requirement can delay registration and result in a penalty fee and an additional fee for a physical examination. Regular clinic hours for the student body are held by staff physicians from 9:00 a.m. to 4:30 p.m., Monday through Friday. Health Services can be reached at all times by telephoning 437-2772.

Specialty clinics in surgery, orthopedic surgery, gynecology, and fertility control and planning are scheduled at specified hours. Please check times with the Health Services office. Pregnancy testing and venereal disease diagnosis and treatment services are always available during clinic hours.

Special x-ray and laboratory procedures that are unavailable in the Health Services, but that are deemed necessary by a staff physician, will be provided. A full spectrum of mental health services is available. A mental health specialist is present daily, and students are urged to use his services even for minor emotional upsets.

Students who become ill while attending classes, examinations, or other activities should report immediately to the University Health Services. Accident or illness requiring the services of a family physician or local hospital should be reported as soon as a student returns to class.

All full-time graduate and undergraduate students are covered by a special Blue Cross and Blue Shield policy which remains in effect continuously from the day of initial registration until the first of the month following withdrawal, dismissal, or graduation. Married students may see the Bursar about purchasing supplementary coverage for dependents.

An infirmary is also maintained in the Forsyth Building for the care of students living in University dormitories and apartment houses. The required fee entitles students to twenty days care in the infirmary at no additional charge.



### The Center for Reading Improvement

The Center for Reading Improvement offers a special non-credit course (SPEED READING) designed to improve skills in rapid, study,

critical, and pleasure reading. Whether the desire is to increase speed or improve understanding — or both — students are taught to apply tested reading and study techniques which strengthen accuracy and recall in all normal reading assignments.

Classes meet one evening a week from 7:00-9:30 and run for one quarter. Students may register during the first week of the Fall, Winter, Spring, or Summer Quarter and will be given a choice of several classes scheduled throughout the week.

There is a discount tuition rate for full-time undergraduate students and all materials are supplied at no expense.

## **The Counseling and Testing Center**

### **Director**

Philip W. Pendleton, Ph.D.

### **Assistant Director**

Priscilla Belcher, Ed.M.

### **Counselors/Psychologists**

David M. Fisch, M.Ed.

Alan O'Hare, M.Ed.

Richard S. Seaman, M.A.

Susan R. Hoffman, Ed.M.

Donald K. Tucker, M.Ed.

The purpose of the Counseling and Testing Center is to help students in a wide variety of areas such as career planning, personal problems, study skills, emotional troubles, choice of major, and inter-personal relationships. At the Center, the student is encouraged to discuss his concerns with a counseling psychologist, following which he might take one or more of these steps: continue individual counseling; take psychological tests to increase his knowledge of himself; join a group of students with whom he can share his concerns; and make use of the Center's extensive file of information about careers and services.

The Center's services are available without charge to all students in the Basic Colleges. Students can arrange an appointment by telephoning (617) 437-2142 or by visiting the Center in Room 302 Ell. Vocational counseling services are also available on a fee basis to high school students and adults.

The counseling services of the Counseling and Testing Center are approved by the International Association of Counseling Services.

## **The Computation Center**

The Computation Center has proved to be invaluable both for teaching and research purposes. Several hundred students have programs run on the computer each day. Both faculty members and students use the Center for nonsponsored research and thesis work.

An increasing amount of research is sponsored by both governmental departments and industrial concerns.



# The Governing Boards and Officers of the University

August, 1977

## THE CORPORATION

Julius Abrams  
Charles F. Adams  
Vernon R. Alden  
William T. Alexander  
William F. Allen, Jr.  
O. Kelley Anderson  
\*Diana J. Auger

Allen G. Barry  
Lincoln C. Bateson  
Thomas P. Beal  
\*Roy H. Beaton  
\*F. Gregg Bemis  
Beverly Ann Bendekgey  
Robert D. Black  
Gerald W. Blakeley, Jr.  
Raymond H. Blanchard  
S. Whitney Bradley  
Rexford A. Bristol  
Edward W. Brooke  
Frederick L. Brown  
\*George R. Brown  
Martin Brown  
William L. Brown  
William H. Bruce, Jr.  
John L. Burns  
Hyman H. Burstein  
Victor C. Bynoe

\*Louis W. Cabot  
\*Norman L. Cahners  
Henry F. Callahan  
Mrs. Anthony S. Camarota  
(Dorothy Dodge)  
Erwin D. Canham  
\*Thomas E. Cargill, Jr.  
\*Richard P. Chapman  
Theodore Chase  
Robert F. Chick  
Vessarios G. Chigas  
Carl W. Christiansen  
Logan Clarke, Jr.  
\*David H. Cogan  
Abram T. Collier  
William A. Coolidge  
Edward Creiger  
H. James Crossan, Jr.

Roger C. Damon  
\*Edward Dana  
William O. DiPietro

Alfred di Scipio  
Estelle Dockser (Mrs.)  
\*William R. Driver, Jr.

\*Carl S. Ell  
\*Byron K. Elliott  
\*William P. Ellison  
Joseph A. Erickson  
Robert Erickson

\*Frank L. Farwell  
\*James V. Fetchero  
Eldred L. Field  
Joseph F. Ford

Thomas J. Galligan, Jr.  
James M. Gavin  
\*Lloyd S. Glidden, Jr.  
Elliott M. Gordon  
John L. Grandin  
Don S. Greer  
\*Donald B. Guy

\*Allan M. Hale  
William Hellman  
\*Ernest Henderson III  
James S. Herbert  
Richard D. Hill  
Charles E. Hodges  
†Harold D. Hodgkinson  
D. Brainerd Holmes  
Robert W. Holmes  
Harvey P. Hood  
Hartwell G. Howe  
John S. Howe  
Howard M. Hubbard  
\*Carl R. Hurtig

\*Robert L. Johnson  
\*Henry C. Jones

George S. Kariotis  
\*Mrs. John B. Kenerson  
(Frances Comins)  
E. Douglas Kenna  
Edward M. Kennedy  
Fenton G. Keyes  
Calvin A. King  
\*Asa S. Knowles  
Harvey C. Krentzman

\*Member of the Board of Trustees

†Lifetime Trustee, Emeritus

Joseph C. Lawler  
 Maurice Lazarus  
 Elma Lewis  
 \*Kenneth A. Loftman  
 Edward A. Loring  
 \*John Lowell  
 Ralph Lowell  
 Diane H. Lupean

Roderick M. MacDougall  
 \*Lawrence H. Martin  
 \*J. Edwin Matz  
 Peter H. McCormick  
 Percy M. McIntosh  
 Andrew J. McNeill  
 Dominic Meo, Jr.  
 William C. Mercer  
 Melanie Berger Messer  
 Don G. Mitchell  
 †Harold A. Mock  
 Frank E. Morris  
 James A. Morris  
 William B. Moses, Jr.  
 \*\* Stephen P. Mugar

William H. Nichols, Jr.  
 Mrs. James Nicholson  
 (Kathryn A. MacKinnon)  
 John T. Noonan

Bernard J. O'Keefe  
 Harry Olins  
 Stanley C. Olsen  
 James H. Orr  
 Ara Oztemel

\*Augustin H. Parker  
 Edward S. Parsons  
 \*Amelia Peabody  
 Theodore R. Peary  
 Nicholas V. Petrou  
 \*Thomas L. Phillips  
 Edward D. Phinney  
 Jerome M. Powell  
 Albert Pratt  
 Peter W. Princi  
 \*William J. Pruyn  
 George Putnam

Blanche M. Quaid  
 \*Francis J. Quirico

William M. Rand  
 William H. Raye, Jr.  
 Kathleen M. Rice  
 \*Joseph G. Riesman  
 R. Earl Roberson  
 Daniel J. Roberts  
 \*Dwight P. Robinson, Jr.  
 Ralph B. Rogers  
 \*Kenneth G. Ryder

Leverett Saltonstall  
 David T. Scott  
 Donald W. Seager  
 Sydney Shaftman  
 James L. Shanahan  
 Robert E. Siegfried  
 Philip A. Singleton  
 \*Donald W. Smith  
 \*Farnham W. Smith  
 \*George A. Snell  
 Bernard Solomon  
 Robert C. Sprague  
 \*Russell B. Stearns  
 \*Earl P. Stevenson  
 David B. Stone  
 \*Robert G. Stone

Lawrence I. Templeman  
 Charles H. Tenney II  
 Almore I. Thompson  
 Milton A. Thompson  
 \*D. Thomas Trigg  
 †Chaplin Tyler

Samuel Wakeman  
 Martin F. Walsh  
 An Wang  
 Lloyd B. Waring  
 Edward A. Weeks  
 William C. White  
 \*Robert H. Willis

Richard W. Young

Vincent C. Ziegler  
 \*\*Alvin C. Zises

\*Member of the Board of Trustees

\*\*Honorary Trustee

†Lifetime Trustee, Emeritus

**THE BOARD OF TRUSTEES**

Robert H. Willis, *Chairman*  
 Norman L. Cahners, *Vice Chairman*  
 William R. Driver, Jr., *Vice Chairman*  
 Frank L. Farwell, *Vice Chairman*  
 Farnham W. Smith, *Vice Chairman*  
 D. Thomas Trigg, *Treasurer*  
 Philip C. Boyd, *Secretary*

Byron K. Elliott, *Honorary Chairman*  
 Dwight P. Robinson, Jr., *Honorary Vice Chairman*  
 Russell B. Stearns, *Honorary Vice Chairman*

**Class of 1977**

Norman L. Cahners  
 Richard P. Chapman  
 Edward Dana  
 William P. Ellison  
 James V. Fetchero  
 Ernest Henderson III  
 Carl R. Hurtig  
 Asa S. Knowles  
 Joseph G. Riesman  
 Dwight P. Robinson, Jr.  
 Donald W. Smith

**Class of 1978**

David H. Cogan  
 Carl S. Ell  
 Frank L. Farwell  
 Lloyd S. Glidden, Jr.  
 Allan M. Hale  
 Henry C. Jones  
 J. Edwin Matz  
 Farnham W. Smith  
 George A. Snell  
 Russell B. Stearns  
 D. Thomas Trigg

**Class of 1979**

Roy H. Beaton  
 F. Gregg Bemis  
 Louis W. Cabot  
 Byron K. Elliott  
 Donald B. Guy  
 Kenneth A. Loftman  
 John Lowell  
 Lawrence H. Martin  
 Augustin H. Parker  
 Francis J. Quirico  
 Earl P. Stevenson

**Class of 1980**

Diana J. Auger  
 George R. Brown  
 Thomas E. Cargill, Jr.  
 William R. Driver, Jr.  
 Robert L. Johnson  
 Mrs. John B. Kenerson  
 (Frances Comins)  
 Amelia Peabody  
 Thomas L. Phillips  
 William J. Pruyn  
 Robert G. Stone  
 Robert H. Willis

*Ex Officio*

††Kenneth G. Ryder

*Honorary Trustees*

Stephen P. Mugar

Alvin C. Zises

*Lifetime Trustees, Emeriti*

Harold D. Hodgkinson

Harold A. Mock

Chaplin Tyler

## ADMINISTRATIVE ORGANIZATION

### Officers of the University

- Harry T. Allan, A.B., B.S., J.D., *Provost*
- John A. Curry, A.B., Ed.M., *Vice President for Administration*
- Edmund L. Deltano, B.A., *Vice President for Finance*
- Carl S. Ell, A.B., S.B., Ed.M., M.S., Sc.D., L.H.D., LL.D., D.S.Ed., *President Emeritus*
- Asa S. Knowles, A.B., A.M., LL.D., Litt.D., Sc.D., D.B.A., Sc.D. in Bus. Ed., *Chancellor*
- Eugene M. Reppucci, Jr., B.S., M.Ed., *Vice President for Development*
- Daniel J. Roberts, B.S., M.B.A., Ed.M., *Vice President for Business*
- Kenneth G. Ryder, A.B., M.A., L.H.D., *President*
- Loring M. Thompson, B.S., M.S., M.A., Ph.D., *Vice President for Physical Planning*
- Royal K. Toebes, B.S., M.B.A., *Vice President for Alumni Affairs and Associate Director of Development*
- Roy L. Wooldridge, B.S., Ed.M., *Vice President for Cooperative Education*

### Academic Deans, Directors of Schools and General Administrative Officers

- Catherine L. Allen, B.S., M.A., Ed.D., Ph.D., *Special Assistant to the President*
- Kenneth W. Ballou, A.B., Ed.M., *Dean of Adult Education*
- Malcolm J. Campbell, B.A., M.Ed., *Associate Dean of Adult Education and Director of the Center for Continuing Education*
- Richard I. Carter, B.S., M.S., *Director of the Computation Center*
- Geoffrey P. E. Clarkson, B.S., M.S., Ph.D., *Dean of Business Administration*
- Gregory C. Coffin, A.B., Ed.M., Ph.D., *Director of Phase II Programs*
- Geoffrey Crofts, B. Comm., *Dean and Director of the Graduate School of Actuarial Science*
- Phillip T. Crotty, Jr., A.B., A.M., M.B.A., Ed.D., *Associate Dean of Business Administration*
- Charles Devlin, B.S., M.Ed., *Assistant to the Vice President of Finance (Financial Aid)*
- Ann M. Duncan-Glasgow, B.S., M.Ed., Ph.D., *Associate Dean and Director of Affirmative Action*
- Martin W. Essigmann, S.B., M.S., *Dean of Research*
- Clifford J. Fralen, B.S., M.S.E., M.B.A., *Director of the Physical Plant*
- William A. Frohlich, B.A., *Director of University Press*
- Dr. Job E. Fuchs, M.D., *Director of Health Services*
- Mina Ghattas, B.A., M.Ed., Ph.D., *Director of the Office of Learning Resources*
- Joseph M. Golemme, S.B., M.A., C.P.A., *Director of the Graduate School of Professional Accounting*
- George W. Hankinson, A.B., B.S., M.S., *Director of the Graduate School of Engineering and Assistant Dean of Engineering*
- Sidney Herman, A.B., M.A., *Associate Dean of University Administration*

Walter S. Jones, A.B., M.S., Ph.D., *Associate Provost*

John W. Jordan, B.S., M.Ed., *Director of the Graduate School of Business Administration and Associate Dean of Business Administration*

Christopher F. Kennedy, A.B., Ed.M., *Dean of Students*

Robert H. Ketchum, B.A., B.D., M.B.A., Ph.D., *Director of the Graduate School of Arts and Sciences and Associate Dean of Liberal Arts*

William F. King, B.S., M.S., *Director of Lincoln College and Associate Dean of Engineering*

Phillip LaTorre, B.S., M.S., *Dean of Personnel Services and Director of Environmental Health*

Paul M. Lepley, B.S., M.Ed., Ed.D., *Dean of Boston-Bouve College and Director of Boston-Bouvé College Graduate School*

Juanita A. Long, B.S.N., M.S.N., C.A.G.S., *Dean of Nursing*

Melvin Mark, B.S., M.S., Sc.D., *Dean of Engineering*

Frank E. Marsh, Jr., A.B., M.Ed., D.Ed., *Dean of Education*

John Martin, B.S., M.B.A., *Business Manager*

Paul D. Maxwell, B.S., M.B.A., *Director of Business Administration Programs and Assistant Dean of University College*

Philip McCabe, B.A., M.Ed., *Dean of Admissions*

Roland H. Moody, A.B., B.L.S. *Director of the University Libraries and Learning Resources*

Timothy L. Moran, B.S., M.Ed., *Director of Law Enforcement Correctional and Security Programs and Associate Dean of University College*

Edmund J. Mullen, B.A., M.Ed., *University Registrar*

Robert Najjar, B.A., M.B.A., *Bursar*

Harold Naidus, A.B., M.S., Ph.D., *Director of Liberal Arts Programs and Associate Dean of University College*

John L. Neumeyer, B.S., Ph.D., *Acting Director of the Graduate School of Pharmacy and Allied Health Professions*

Robert O'Brien, B.S., *Director, Administrative Computer Services*

John C. O'Byrne, A.B., M.S., J.D., *Dean of the School of Law*

Donald G. Porter, A.B., M.B.A., *Director of Development*

Paul M. Pratt, B.S., M.Ed., *Dean of the Department of Cooperative Education*

Gregory T. Ricks, B.A., M.C.P., *Special Assistant to the President*

Nathan Riser, A.B., A.M., Ph.D., *Director of Marine Science Institute*

Norman Rosenblatt, A.B., Ph.D., *Dean of Criminal Justice and Director of the Graduate Program of Criminal Justice*

George A. Rowland, B.S., M.Ed., *Acting Director of the African-American Institute*

Philip J. Rusche, B.A., B.S.Ed., M.A., Ed.D., *Director of the Graduate School of Education and Associate Dean of Education*

Victor D. Warner, B.S., Ph.D., *Acting Dean of Pharmacy and Allied Health Professions*

Joseph Zabilski, B.S., *Director of Athletics*

## GENERAL UNIVERSITY COMMITTEES

### The Executive Council

Kenneth G. Ryder, *Chairman*

Barbara F. Burke, *Secretary*

Harry T. Allan

John A. Curry

Eugene M. Reppucci, Jr.

Daniel J. Roberts

Roy L. Wooldridge

### The Academic Council

Harry T. Allan, *Chairman*

Joan R. Lipson, *Secretary*

Kenneth W. Ballou

Geoffrey P. E. Clarkson

Walter S. Jones

Paul M. Lepley

Juanita Long

Melvin Mark

Frank E. Marsh, Jr.

John C. O'Byrne

Paul M. Pratt

Norman Rosenblatt

Victor D. Warner

John A. Curry, *ex officio*

Roy L. Wooldridge, *ex officio*

### The Faculty Senate

\*Harry T. Allan

Donald H. Berman

Janet Carroll

\*Geoffrey Clarkson

Elaine G. Eliopoulos

Irene R. Fairley

M. Rita Flynn

Martha E. Francois

Stavros S. Frantzis

Marvin H. Friedman

Robert E. Gilbert

Arthur M. Halpern

Gerald H. Herman

Christine Hobart

Melvin Howards

\*Walter S. Jones

Robert D. Klein

Louise LaFontaine

Frank F. Lee

Kenneth M. Leet

\*Paul M. Lepley

Morton Loewenthal

\*Juanita Long

Robert P. Lowndes

William D. McLaurin

\*Melvin Mark

\*Frank E. Marsh, Jr.

J. Edward Neighbor

Sandra M. Parker

Patrick F. Plunkett

\*Paul M. Pratt

John G. Proakis

James R. Reed

\*Norman Rosenblatt

Jeanne L. Rowlands

Daniel C. Scioletti

Elliot Spector

Harold L. Stubbs

\*Victor D. Warner

Roy Weinstein

Alvin J. Yorra

### Presiding Officer

Harry T. Allan

# Academic Calendar 1977-1979

## September 1977

5	Monday	LABOR DAY. University closed.
6-9	Tuesday-Friday	Final Examinations for Basic Colleges.
12-24	Monday-Saturday	Division A vacation.
15	Thursday	FALL COMMENCEMENT.
26	Monday	Beginning of 1977-1978 academic year. Upper class registration for Divisions A and C. Boston and Burlington freshmen complete their registration. No Basic Colleges classes today.

## October 1977

10	Monday	COLUMBUS DAY. University closed.
----	--------	----------------------------------

## November 1977

11	Thursday	VETERANS' DAY. University closed.
24-26	Thursday-Saturday	THANKSGIVING DAY recess.

## December 1977

12-16	Monday-Friday	Final Examinations for Basic Colleges.
19-Jan. 2	Monday-Friday	CHRISTMAS vacation.

## January 1978

2	Monday	NEW YEAR'S DAY Observance University closed.
3	Tuesday	Registration for upper-class Divisions B and C. Registration for freshmen (Quarter Two) at Boston Campus, Burlington Campus, and January freshmen section of Class of 1982. Beginning of Winter Quarter. Beginning of Division A work quarter. No Basic Colleges classes today.
16	Monday	MARTIN LUTHER KING, JR'S. BIRTHDAY. University closed.

## February 1978

20	Monday	WASHINGTON'S BIRTHDAY. University closed.
----	--------	---

## March 1978

20-24	Monday-Friday	Final Examinations for Basic Colleges.
27-31	Monday-Friday	Vacation period for all students in all colleges and schools (Division B vacation).

## April 1978

3	Monday	Registration for Divisions A and C students and Division B seniors. Registration for freshmen (Quarter Three) at Boston Campus, Burlington Campus, and January freshmen (Quarter Two). Beginning of Spring Quarter. Beginning of Division B work period. No Basic Colleges classes today.
17	Monday	PATRIOTS' DAY. University closed.

## May 1978

29	Monday	MEMORIAL DAY. University closed.
----	--------	----------------------------------

## June 1978

12-16	Monday-Friday	Final Examinations for Basic Colleges.
-------	---------------	--

18	Sunday	COMMENCEMENT.
19-23	Monday-Saturday	Division A vacation.
26	Monday	Registration for Divisions B and C and January freshmen (Quarter Three) Beginning of Summer Quarter. Beginning of Division A work quarter. No Basic Colleges classes today.
<b>July 1978</b>		
4	Tuesday	INDEPENDENCE DAY. University closed.
<b>September 1978</b>		
4	Monday	LABOR DAY. University closed.
5-8	Tuesday-Friday	Final Examinations for Basic Colleges.
11-23	Monday-Saturday	Division B vacation.
14	Thursday	FALL COMMENCEMENT.
25	Monday	Beginning of 1978-1979 academic year. Upper-class registration for Divisions B and C. No Basic Colleges classes today.
<b>October 1978</b>		
9	Monday	COLUMBUS DAY. University closed.
<b>November 1978</b>		
11	Saturday	VETERANS' DAY. University closed.
23-25	Thursday-Saturday	THANKSGIVING DAY recess.
<b>December 1978</b>		
11-15	Monday-Friday	Final Examinations for Basic Colleges.
18-Jan. 1	Monday-Friday	CHRISTMAS vacation.
<b>January 1979</b>		
1	Monday	NEW YEAR'S DAY. University closed.
2	Tuesday	Registration for upper-class Divisions A and C. Registration for freshmen (Quarter Two) at Boston Campus, Burlington Campus, and January freshmen section of Class of 1983. Beginning of Winter Quarter. Beginning of Division B work quarter. No Basic Colleges classes today.
15	Monday	MARTIN LUTHER KING, JR'S. BIRTHDAY. University closed.
<b>February 1979</b>		
19	Monday	WASHINGTON'S BIRTHDAY. University closed.
<b>March 1979</b>		
19-23	Monday-Friday	Final Examinations for Basic Colleges.
26-31	Monday-Saturday	Vacation period for all students in all colleges and schools (Division A vacation).
<b>April 1979</b>		
2	Monday	Registration for Divisions B and C students and Division A seniors. Registration for freshmen (Quarter Three) at Boston Campus, Burlington Campus, and January freshmen (Quarter Two). Beginning of Spring Quarter. Beginning of Division A work period. No Basic Colleges classes today.
16	Monday	PATRIOTS' DAY. University closed.
<b>May 1979</b>		
28	Monday	MEMORIAL DAY. University closed.
<b>June 1979</b>		
11-15	Monday-Friday	Final Examinations for Basic Colleges.
17	Sunday	COMMENCEMENT.
18-23	Monday-Saturday	Division B vacation.



25	Monday	Registration for Divisions A and D and January freshmen (Quarter Three). Beginning of Summer Quarter. Beginning of Division B work quarter. No Basic Colleges classes today.
<b>July 1979</b>		
4	Wednesday	INDEPENDENCE DAY. University closed.
<b>September 1979</b>		
3	Monday	LABOR DAY. University closed.
4-7	Tuesday-Friday	Final Examinations for Basic Colleges.
10-22	Monday-Saturday	Division A vacation.
13	Thursday	FALL COMMENCEMENT.
24	Monday	Beginning of 1978-1979 academic year. Upper-class registration for Divisions A and C. Boston and Burlington freshmen complete their registration. No Basic Colleges classes today.



# Index

## A

- About Admissions, 174-183**
- ABOUT NORTHEASTERN, 7**
- Academic Awards, Honor Societies and, 204-208**
- Academic Calendar, 247**
- ACADEMIC PROGRAMS, 34**
- Accounting Concentration, 52-53
  - professional preparation, 52*
- accounting, professional, graduate school, 171
- actuarial science, graduate school, 169
- Admission of Transfer Students, 182
- Admissions, 174-183**
- admissions conference, 174
- advanced placement, 178
- Afro-American Studies, 114-115
  - professional preparation, 114*
- Allied Health Professions, 153-165
  - faculty, 153*
  - uniforms, 186*
- Allied Health Professions, College of Pharmacy and, 153-165**
- graduate school, 170
- alternative program, freshman-year, 179
- Alumni Association, 32**
- A Message from the President, 3**
- Anthropology, Sociology and, 144-147
  - faculty, 144*
  - professional preparation, 144*
- apartments, 211
- application procedure, transfer students, 182
- Applying for Admission, 178-181
- Art, 116
  - faculty, 116*
  - professional preparation, 116*
- arts and sciences, graduate school, 169
- A Student's Voice, 24-25**
- Athletics, 218-219
  - attendance, 226*

## B

- basic requirements, transfer students, 182
- Biology, 117-118
  - faculty, 117*
  - laboratories, 118*
  - professional preparation, 117-118*
- Biomedical Engineering, 99
  - professional preparation, 99*
- Boston and Northeastern, 10-19**
- Boston-Bouvé College, 35-47**
- accreditation, 37*
- admission, 36*
- facilities, 35*
- focus on the student, 37*
- graduate school, 169*
- graduation requirements, 36*
- graduation with honors, 37*

- qualifications, 36*
- professional preparation, 35*
- uniforms, 185*
- Buildings and Facilities, 20-23**
- Bureau of Business Research, 179
- Business Administration, College of, 48-68**
- accreditation, 51*
- basic course requirements, 52*
- faculty, 48-49*
- graduate school, 169*
- graduation requirements, 51*
- graduation with honors, 51*
- professional preparation, 49-50*
- sample freshman-year program, 51*

## C

- Calendar, Academic, 247**
- Center for Continuing Education, 171
- Center for Management Development, 171
- Center for Reading Improvement, The, 239**
- Chapel, 217
- Chemical Engineering, 80-81
  - accreditation, 81*
  - basic course requirements, 81*
  - faculty, 80*
  - laboratories, 81*
  - professional preparation, 80*
- Chemistry, 119-120
  - accreditation, 120*
  - facilities, 120*
  - faculty, 119*
  - professional preparation, 119-120*
- Civil Engineering, 82-85
  - basic course requirements, 85*
  - faculty, 82*
  - laboratories, 83-84*
  - professional preparation, 82-83*
- College Expenses, 184-187**
- college level examination program, 178
- Colleges
  - Boston-Bouvé, 35
  - Business Administration, 48
  - Criminal Justice, 66
  - Education, 69
  - Engineering, 76
  - Lincoln, 101
  - Liberal Arts, 108
  - Nursing, 148
  - Pharmacy and Allied Health Professions, 153
- Computation Center, The, 240**
- Contents, 6**
- Cooperative Education, 231-235**
- International Programs in, 234-235
- The Center for Cooperative Education, 234
- The Cooperative Education Research Center, 235

- The Department of  
Cooperative Education,  
232
- The Department of  
Graduate Placement  
Services, 233
- The Institute for Off-Campus  
Experience and Cooperative  
Education, 234
- cooperative freshman-year  
program  
engineering, 180  
business administration, 180
- Cooperative Plan, The, 30-31**
- Counseling and Testing Center,  
The, 240**
- Credits, 256**
- Criminal Justice, College of,  
66-68**  
basic course requirements, 68  
faculty, 66  
graduation requirements, 67  
graduation with honors, 67  
human services, 67  
professional preparation, 66-67
- D**
- dean's list, 225
- deferred admissions plan, 178
- Dental Hygiene, 157-158  
accreditation, 157  
basic course requirements, 158  
other information, 157  
professional preparation, 157  
sample freshman-year program,  
158
- Drama and Speech, 121-123  
accreditation, 122  
drama, 121-122  
faculty, 121  
professional preparation, 121-122  
speech communication, 123
- E**
- early admission, 177
- Earth Sciences, 121-122  
faculty, 121  
professional preparation, 121-122  
special information, 122
- Economics, 123-124  
faculty, 123  
professional preparation, 123-124
- Education, College of 69-75**  
accreditation, 72  
basic course requirements, 73-74  
faculty, 69  
graduation requirements, 71  
graduate school, 170  
graduation with honors, 71  
human services, 71  
National Teacher Examination,  
72  
professional preparation, 70  
sample freshman-year programs,  
72
- Electrical Engineering, 86-90  
basic course requirements, 88-89  
electives, 89  
faculty, 86  
laboratories, 88  
power systems engineering, 89-90
- Electrical Engineering Technology,  
103-104  
basic course requirements, 104  
professional preparation, 103
- Elementary Education, 70
- Engineering, College of, 76-100**  
accreditation, 78  
cooperative freshman-year  
program, 180  
graduate school, 170  
graduation requirements, 78  
graduation with honors, 78  
professional preparation, 76  
programs, 76-78  
sample freshman-year program,  
79  
women in engineering, 78
- English, 127-128  
faculty, 127  
professional preparation, 127-128
- entrance examinations, 177
- Entrepreneurship, and New  
Venture Management, 54-55
- entry dates, 177
- Equal Opportunity Policy, 4
- Expenses, College, 184-187  
Expenses for the Freshman  
Year, 184  
Expenses for Upperclassmen,  
185  
Expenses, Total, 184
- F**
- Faculty, The—Scholars,  
Innovators, Advisers, 25-28**  
family educational rights and  
privacy act, 226
- Federal Programs, 189-190
- Fees, Other, 185-186
- Fees, Required, 185-186
- Finance and Insurance  
Concentration, 55-57  
professional preparation, 55
- Financial Aid, 188-203**  
application, 188  
transfer students, 182
- food plan, 211
- Foreign Student Information, 220
- fraternities, 215
- fraternity housing, 210
- Freshman Orientation Programs,  
220
- Freshmen Scholarships, 190-194
- freshman-year alternative  
program, 179
- freshmen-year cooperative  
program  
engineering, 180  
business administration, 180
- G**
- general and special health  
requirements, 183
- General Concentration, Business  
Administration, 65

- general conduct, 226
- General Engineering, 90-92
  - advisory committee*, 90
  - professional preparation*, 90-91
- general fees, 186
- GENERAL INFORMATION, 222**
- General Information, 224-226**
- General Requirements for
  - Entrance, 175
- Governing Boards and Officers of the University, The, 242-247**
- grades and examinations, 224
- Graduate and Professional Schools, 169-171
  - Actuarial Science, 169
  - Arts and Sciences, 169
  - Boston-Bouvé, 169
  - Business Administration, 169
  - Criminal Justice, 169
  - Education, 170
  - Engineering, 170
  - Law, 170
  - Pharmacy and Allied Health Professions, 170
  - Professional Accounting, 171
- Graduate Placement Services, 233
- graduation fee, 185
- Graphic Science, 100
  - faculty, 100
  - professional preparation*, 100
- H**
- Health Education, School and Community, 38-39
- health requirements, general and special, 183
- Health Professions, Allied, 153-166
- History, 222**
- History, 128-129
  - faculty*, 128
  - professional preparation*, 128-129
- Honor Societies and Academic Awards, 200-204**
- Honors and Awards, 204-208
- Housing, 209-211**
- Human Resources Management
  - Concentration, 57-59
- Human Services, 166-167
- Hygiene, Dental, 157-158
- I**
- Index, 251-256**
- Industrial Engineering, 93-95
  - basic course requirements*, 95
  - faculty*, 93
  - professional preparation*, 93-95
  - special information*, 94
- INFORMATION, GENERAL, 222**
- Information, General, 222-226**
- Information, Foreign Student, 220
- Institute for Off-Campus
  - Experience and Cooperative Education, 234
- insurance, fees, 185
- International Business
  - Concentration, 60-61
  - electives*, 61
  - professional preparation*, 60-61
- International Programs
  - in Cooperative Education, 234
- interview, 174
- intramural sports, 218
- J**
- Journalism, 130-131
  - faculty*, 130
  - professional preparation*, 130-131
- L**
- Laboratory deposit fees, 186
- (See Human Resources Management Concentration)
- late payment, fees, 186
- law, graduate school, 170
- Learning Resources, Office of, 238
- Liberal Arts, College of, 108-147**
  - accreditation*, 112
  - graduate school*, 169
  - graduation requirements*, 111
  - graduation with honors*, 112
  - honors programs*, 110
  - human services*, 109
  - independent major*, 109
  - placement techniques*, 110
  - preprofessional advising*, 110-111
  - professional preparation*, 108-109
  - sample freshman-year programs*, 112
  - self-planned program*, 109
- Libraries, University, 236-238**
- Lincoln College, 101-107**
  - aviation technology*, 104
  - computation center*, 103
  - facilities*, 102-103
  - graduation requirements*, 102
  - graduation with honors*, 102
  - professional preparation*, 101-102
  - sample freshman-year program*, 104
- M**
- Management Concentration, 62
  - professional preparation*, 62
- Management Development, Center for, 171
- Map, 250**
- Marketing Concentration, 63
  - professional preparation*, 63
- Mathematics, 131-132
  - faculty*, 131
  - professional preparation*, 131-132
- Mechanical Engineering, 96-98
  - basic course requirements*, 98
  - faculty*, 96
  - professional preparation*, 96-97
  - special information*, 97
- Mechanical Engineering
  - Technology, 106-107
  - basic course requirements*, 107
  - faculty*, 106
  - professional preparation*, 106-107
- Medical Laboratory
  - Science/Medical Technology, 159-160
  - accreditation*, 159

*basic course requirements*, 160  
*other information*, 159-160  
*professional preparation*, 159  
*sample freshman-year program*, 160

Medical Record Administration,  
 161-162  
*accreditation*, 161  
*basic course requirements*, 162  
*professional preparation*, 161  
*sample freshman-year program*, 161

**Message from the President, A, 3**  
 minority group students, programs  
 for, 179

Modern Languages, 133-134  
*faculty*, 133  
*professional preparation*, 133-134

Music, 147  
*faculty*, 147

## N

National Teacher Examination, 72

New Venture Management,  
 Entrepreneurship, 54-55

## Nursing, College of, 148-152

*accreditation*, 150  
 Associate Degree, 151  
*basic course requirements*, 151  
*sample freshman-year program*, 150  
 Associate Degree, LPN, 150-151  
*basic course requirements*, 151  
*sample freshman-year program*, 150  
 Baccalaureate Degree, 150  
*basic course requirements*, 152  
*sample freshman-year program*, 151  
*faculty*, 148  
*graduation requirements*, 150  
*graduation with honors*, 150  
*licensure*, 150  
*professional preparation*, 148  
*special requirements*, 150  
*uniforms*, 186

## O

**Office of Learning Resources, 236**  
*division of instructional media*, 238

open campus courses, 180

**Other Schools and Colleges, 168-171**  
 overloads, 187

## P

### PARTICULARS OF EDUCATION, 172

pass-fail system, 224

Pharmacy, 155-157  
*accreditation*, 156  
*basic course requirements*, 156  
*faculty*, 155

*graduation requirements*, 153-154  
*graduation with honors*, 154  
*licensure*, 154  
*professional preparation*, 153  
*sample freshman-year program*, 154

### Pharmacy and Allied Health Professions, College of, 153-166

*accreditation*, 156  
*degrees granted*, 154  
*facilities*, 154  
 graduate school, 170  
*professional preparation*, 153-154

Philosophy and Religion, 135-136  
*faculty*, 135  
*professional preparation*, 135-136

### Philosophy of Education, The, 8-9

Physical Education, 40-42  
*accreditation*, 41  
*basic course requirements*, 42  
*electives*, 41  
*faculty*, 40  
*intramural and extramural programs*, 42  
 Modern Dance Theatre and Jazz Dance Company, 41  
*professional preparation*, 40-41  
*sample freshman-year program*, 42  
 women's intercollegiate athletics, 41

Physical Therapy, 43-45  
*accreditation*, 44  
*basic course requirements*, 45  
*faculty*, 43  
*professional preparation*, 43-44  
*sample freshman-year program*, 44  
*uniforms*, 44

Physician Assistant, 163-166  
*accreditation*, 164  
*basic course requirements*, 164  
*other information*, 164  
*professional preparation*, 163  
*sample freshman-year program*, 165  
*special requirements*, 163

Physics, 137-139  
*faculty*, 137  
*honors program*, 139  
*professional preparation*, 139  
*undergraduate research*, 139

Political Science, 139-140  
*faculty*, 139  
*professional preparation*, 139-140

power systems engineering, 87

**President, A message from the, 3**

professional accounting,  
 professional school, 170

Professional Schools, Graduate  
 and, 169-171

professional societies, 216

Project Ujima Program, 179

Psychology, 141-143  
*faculty*, 141  
*professional preparation*, 141-143

- Q**  
quarter-hour credits, 34, 224
- R**  
**Reading Improvement, The Center for, 239**  
Recreation Education, 46-47  
*accreditation, 47*  
*basic course requirements, 47*  
*faculty, 46*  
*professional preparation, 46-47*  
*sample freshman-year program, 47*  
*special requirements, 47*  
Refunds, 187  
Regulations, Tuition and, 5, 34  
Religion, Philosophy and, 135-136  
*faculty, 135*  
*professional preparation, 135-136*  
reports on scholastic standing, 225  
Religious Life, 213  
Required Fees, 185  
*application, 185*  
*graduation, 185*  
*insurance, 185*  
*student center, 185*  
*uniforms, 185*  
Requirements for Entrance, General, 175  
**Research, 29**  
**Reserve Officers' Training Corps, 227-230**  
*academic credits, 229*  
*courses of study, 227*  
*eligibility, advanced course, 228*  
*eligibility, flight training, 228*  
*enrollment, basic course, 228*  
*faculty, 227*  
*general objectives, 227*  
*pay, 228*  
*scholarships, 228*  
*transfer students, 229*  
*uniforms and equipment, 229*  
*veterans, 229*  
Residence Halls, 209-211  
*apartments, upperclassmen, 211*  
*cars, 210*  
*food plan, 211*  
*fraternity housing, 210*  
*selection, 210*  
Respiratory Therapy, 164  
*accreditation, 165*  
*basic course requirements, 165*  
*professional preparation, 163*  
*sample freshman-year program, 165*  
163  
rolling admission plan, 178
- S**  
Scholarships for Freshmen, 190-194  
Scholarships for Upperclassmen, 194-203  
scholarships, ROTC, 227-231  
scholastic standing, reports on, 225  
School and Community Health Education, 38-39  
*accreditation, 39*  
*basic course requirements, 39*  
*college and university services, 38*  
*faculty, 38*  
*professional preparation, 38*  
*sample freshman-year program, 39*  
*special requirements, 39*  
**Schools and Colleges, Other, 168-171**  
Secondary Education, 70-71  
Sociology and Anthropology, 144-147  
*faculty, 144*  
*professional preparation, 144*  
special students, 181  
Speech and Hearing Therapy, 71  
Speech, Drama and, 121-123  
*drama, 121-122*  
*speech communication, 123*  
State Scholarship Programs, 189  
**Student Activities, 212-220**  
*fraternities, 215*  
*intramural sports, 215*  
*professional societies, 216*  
*special interest groups, 213-214*  
*student center, fee, 155*  
Student Information, Foreign, 220  
**Student's Voice, A, 24**  
supplies, textbooks, and, 224
- T**  
Technology, Electrical Engineering, 105-106  
Technology, Mechanical Engineering, 106-107  
Technology, Medical, 159-160  
textbooks and supplies, 224  
tours, 174  
transcripts, 225  
Transfer Students, Admission of, 182  
ROTC, 229  
Transportation Management Concentration, 64-65  
Tuition and Regulations, 5, 34  
Tuition/deferred payment, 166
- U**  
Uniforms: Allied Health Professions, 186  
Boston-Bouvé, 185  
Nursing, 186  
Uniforms and equipment, ROTC, 186, 229  
University College, 168  
**University Libraries, 234-235**  
*libraries, 236-237*  
*New England Library Information Network, 237*

*principal officers*, 236  
*services and hours*, 236  
 Upperclass Scholarships,  
 194-203

## V

veterans, ROTC, 229

## W

women in engineering, 78  
 women in engineering technology,  
 104  
 women's intercollegiate athletics,  
 41

## Credits

Photography credits are extended to Ellis Herwig,  
 Jet Photo, Dean William F. King, Rob MacIntosh, Frank Moy,  
 Julie O'Neil, Al Giese, and Gerald Schrader.

Cover and title page designed by Patricia Packer.

Divider pages designed by Bill St. George.

Typesetting: Modern Graphics, Inc.

Printing: Semline, Inc.



## **Gifts and Bequests**

**Northeastern University welcomes gifts and bequests to further its educational purposes. It is suggested that, when possible, those contemplating gifts or bequests to Northeastern confer with the President of the University regarding the University's needs before legal papers are drawn.**

**The legal name of the University is "Northeastern University." However, in the making of gifts and bequests to Northeastern, the following wording is suggested: "Northeastern University, an educational institution incorporated under the laws of Massachusetts and located in Boston, Massachusetts."**

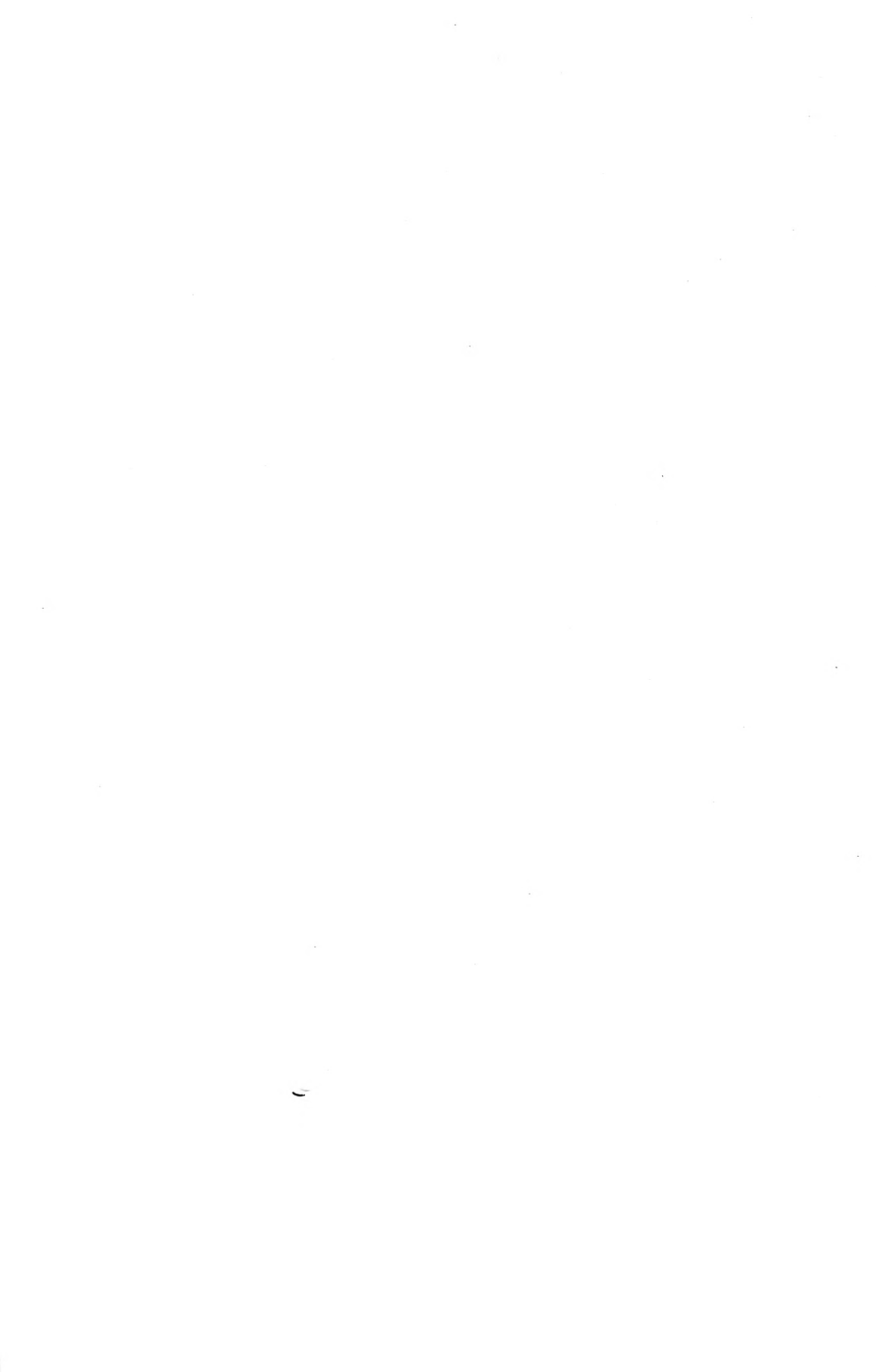
## **Delivery of Service**

**The University assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements and acts of public authorities. The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities or performance, but its inability or failure to do so shall not subject it to liability."**

ortheastern University  
Department of Admissions  
60 Huntington Avenue  
Boston, Massachusetts 02115

Second Class  
Postage Paid at  
Boston, Massachusetts







*Acme*

Bookbinding Co., Inc.  
300 Summer Street  
Boston, Mass. 02210



